

No. 16,481 ✓

IN THE

**United States Court of Appeals
For the Ninth Circuit**

EVIS MANUFACTURING COMPANY, a corporation,
ARTHUR N. WELLS,

Petitioners,

vs.

FEDERAL TRADE COMMISSION,

Respondent.

PETITIONERS' OPENING BRIEF.

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JURISDICTIONAL STATEMENT.

This is a proceeding to review an order of the Federal Trade Commission directing petitioners to cease and desist from making certain representations in connection with the offering for sale, sale and distribution of a product known as the Evis Water Conditioner. The order was issued on March 23, 1959 (R. I, 804-805). It was served on petitioners on April 2, 1959 (R. VII, 2). The petition for review was filed on May 29, 1959. Petitioners are Evis Manufacturing Company and Arthur N. Wells, a vice president of that company. Both petitioners are residents of, and carry on business in, this Circuit (R. II, 404, 472). They made the representations complained of within this Circuit (R. II, 404-407, 413). This Court has jurisdiction under section 5(c) of the Federal Trade Commission Act as amended (15 U.S.C. 45(c)).

DESCRIPTION OF THE RECORD.

Pursuant to the order of this Court (dated July 17, 1959) the record is unprinted. It consists of seven volumes and twelve physical exhibits. There are two numbering systems: Volumes I and VI are consecutively numbered from page 1 through page 1163. These volumes contain the pleadings, motions, briefs, decisions, notices and correspondence, and the documentary and photographic exhibits. Volumes II through V are consecutively numbered from page 1 through page 3994. These volumes contain the transcript of testimony and other oral proceedings. Volume VII contains the docket sheets of the proceeding. In this brief, references to the record will be by volume and page, e.g., page 1 of Volume I will be cited "R. I, 1"; page 1 of Volume II will be cited "R. II, 1." The Commission's exhibits were identified as "CX"; the exhibits of petitioners (respondents below) were identified as "RX." References to physical exhibits will include the identification number assigned by the Hearing Examiner, the page of the record where the exhibit is identified and the number assigned by the Commission in certifying the record to this Court. For example, Commission's Exhibit No. 4 (copper tubings used in an experiment) will be referred to as "CX 4, R. VI, 823; 2-1/6168-1." Appendix A to this brief contains a list of all exhibits with references to the pages of the record where each is found, and also where each was identified, offered and received, as required by Rule 18(2)f of the Rules of this Court.

STATEMENT OF THE CASE.**A. Summary of the proceedings below.**

This proceeding was brought in 1954 by the Federal Trade Commission to enjoin alleged misrepresentations in connection with the sale of a water conditioning unit invented by petitioner Wells and manufactured and sold by petitioner Evis Manufacturing Company (R. I, 1). Hearings commenced on May 12, 1954, and ended four years later, in April, 1958. The testimony of 124 witnesses was taken in Los Angeles, San Francisco and Fresno, California; Pullman, Tacoma and Seattle, Washington; Portland, Oregon; Cleveland, Ohio; Washington, D.C.; Dallas, Texas; and Charlottesville, Virginia. Sixty-eight exhibits were introduced. The transcript comprises 4,000 pages.

Twice the Hearing Examiner, who heard the witnesses and judged their credibility, held that the Commission had failed to sustain the allegations of the complaint (R. I, 512, 692). Twice the Commission reversed. It held on the first appeal that further evidence should be taken (R. I, 654); on the second, that the findings of the Hearing Examiner should be disregarded and a cease and desist order should issue (R. I, 797-817). This petition for review followed.

B. The facts.

Prior to 1952 petitioner Wells, after many years of experimentation (R. II, 416), invented a specially processed metal casting, resembling cast iron, designed to be fitted into water systems for the purpose of beneficially affecting water in homes and in industrial and

agricultural installations.¹ The inventor claims that the unit has an influence on water, in the nature of a catalytic action, which changes the physical behavior of the water so as to produce the represented beneficial results (R. II, 415, 429). A patent was applied for and the application for a patent is still being processed in the Patent Office (R. I, 413-414). Under the procedures of that Office, the file is sealed and its disclosures will not be made public unless and until a patent issues.

The unit was made of specially processed metal with inclusions not ordinarily present in cast iron (R. I, 422, 425-426). While the complaint charged that it was false to represent that the unit was made of a specially processed metal, both the Hearing Examiner and the Commission held that this charge had not been sustained (R. I, 698, 802). The Commission's own witnesses, after spectrographic and photomicrographic analyses, testified that the metal was specially processed and contained inclusions not ordinarily found in cast iron (R. II, 93, 479, 929, 942).

In 1952 petitioner Evis Manufacturing Company was organized to manufacture and market the unit (R. II, 412). The venture was an immediate success. Sales in 1953, the first full year of operation, were approximately \$1,250,000 (R. I, 333). All units were sold with a money back guarantee (R. IV, 2916, 3148; and see for example, CX 33, R. VI, 902). Numerous units were installed on a free trial basis (R. III, 1812, 2120, 2135, 2165; R. IV, 2275, 2320, 2707; R. V, 3469).

¹The invention was also used to process a bronze casting for copper lines and for salt or acid waters.

The company's customers included the most responsible and informed buyers in America: the United States Government,² State schools, colleges and institutions,³ steamship companies,⁴ oil well drilling companies,⁵ major oil companies,⁶ lumber and plywood mills,⁷ department stores,⁸ laundries,⁹ restaurants,¹⁰ and numerous other substantial businesses and manufacturing plants.¹¹

Without exception every witness who had used the unit in the normal, practical installations for which it was intended testified to beneficial results. Ninety-two witnesses testified to results obtained in more than 255 installations. Witnesses from every walk of life appeared, including representatives of the following industries and institutions: air conditioning and refrigeration,¹² newspaper,¹³ canning,¹⁴ meat packing,¹⁵ marine repair,¹⁶

²R.IV, 2325-2340; 2677-2687; 2688-2703; 2704-2718.

³R.III, 2218-2233; R.IV, 2838-2849; 3366-3390; R.V, 3460-3493.

⁴R.IV, 2388-2412; 2637-2663; 2672-2677; 2748-2763; 2892-2906; 3168-3178; 3392-3397; 3397-3405; R.VI, 1026-1062; 1066-1099; 1100-1129; 1131-1161; see also RX 48, R.VI, 1013-1017.

⁵R.III, 2033-2060; R.V, 3409-3436; 3436-3450; 3518-3529, 3543-3558; 3559-3563, 3583-3611; 3705-3723.

⁶R.III, 2145-2155.

⁷R.III, 1963-1973; R.IV, 3101-3118; 3119-3132; 3133-3142; 3178-3190; 3220-3226; 3237-3252.

⁸R.III, 1839-1891; 1976-2011.

⁹R.IV, 2598-2620; 3190-3202; 3329-3338.

¹⁰R.III, 1804-1839; 1839-1891; 1976-2011.

¹¹R.III, 1892-1930; 2090-2114; 2157-2192; 2268-2291; R.VI, 2551-2559; 2764-2772; 3077-3089; R.V, 3530-3543; 3564-3581; 3686-3704.

¹²R.III, 1931-1963; R.IV, 2268-2291.

¹³R.IV, 2292-2296, 2307-2325; 2296-2307.

¹⁴R.III, 2157-2192.

¹⁵R.III, 1892-1930; R.V, 3612-3625.

¹⁶R.IV, 2346-2360.

lumber and lumber products,¹⁷ petroleum,¹⁸ restaurant,¹⁹ school,²⁰ department store,²¹ supermarket,²² fish processing,²³ hotel,²⁴ ranching and farming,²⁵ nursery,²⁶ bottling²⁷ and tool manufacturing,²⁸ as well as private homes and apartment houses.²⁹

In the steamship industry alone the testimony showed that 281 Evis units (all but a few of which are in addition to the 255 units mentioned above) were in use on 245 vessels of 76 shipping concerns, including such internationally known companies as American Mail Line, American President Lines, Isthmian Steamship Company, Luckenbach Steamship Company, Moore-McCormack Lines, Inc., Matson Navigation Company, Pacific Far East Lines, Inc., Pacific Transport Lines, Pope & Talbot Inc., Rotterdam-Lloyd Line, Swedish American Line, Transoceanic Marine Corporation, United Fruit Company and Waterman Steamship Corporation (R. VI, 1013-1017). Many of these companies equipped their vessels only after they had first established to their own satisfaction, through actual ship-

¹⁷R.III, 1963-1973; R.IV, 3101-3118; 3119-3132; 3133-3142; 3178-3190; 3220-3226; 3237-3252.

¹⁸R.III, 2033-2060; R.V, 3409-3436; 3436-3450; 3518-3529, 3543-3558; 3559-3563, 3583-3611; 3643-3673; 3705-3723.

¹⁹R.III, 1804-1839; 1839-1891; 1976-2011.

²⁰R.III, 2218-2233; R.IV, 2838-2849; 3366-3390; R.V, 3460-3493.

²¹R.III, 1839-1891; 1976-2011.

²²R.IV, 2551-2559.

²³R.IV, 2474-2481; 3352-3362.

²⁴R.V, 3493-3502; 3502-3516.

²⁵R.III, 1732-1777; 1804-1839; 2011-2032; 2114-2129, 2138-2145.

²⁶R.III, 2069-2090; 2234-2242; 2243-2253; 2253-2266.

²⁷R.III, 2129-2137.

²⁸R.III, 2060-2067.

²⁹R.III, 1777-1804; 2011-2032; 2033-2060; 2069-2090; 2253-2266; R.IV, 2875-2891; R.V, 3675-3685.

board trial, that the Evis unit produced the results for which they were looking (R. IV, 2443). United Fruit Company has installations on 25 vessels, Waterman Steamship Corporation on 30 vessels, Luckenbach Steamship Company on 14 vessels, and the Military Sea Transport Service of the United States Government on 4 vessels (R. VI, 1013-1017).

Witnesses testified to successful installations on boilers, air-conditioning equipment, evaporative condensers, commercial laundry machines, ice-making machines, dishwashers, drains, coffee urns, refrigeration equipment, hospital equipment, showers, nozzles, pipes, valves, and a host of other types of equipment used in water systems (see Appendix C).

Experienced operating engineers performed carefully controlled parallel tests by installing an Evis unit on one piece of equipment and leaving other identical or similar equipment unchanged. In each instance, marked differences were evident. With the equipment operating at the same time and under similar conditions no change occurred in the untreated equipment; on the Evis-treated equipment, old scale deposits were removed and scaling was prevented.³⁰

These witnesses were not the ignorant and the gullible. With few exceptions they were licensed professional or

³⁰The Post Office and Courthouse Building in Fresno, California (R.IV, 2325-2340; 2677-2687); the plant of the Central Valley Ice Company in Fresno, California (R.IV, 2268-2291); the Fresno Bee Building, Fresno, California (R.IV, 2292-2296; 2307-2325; 2296-2307); the Bridgford Packing Company plant at Anaheim, California (R.III, 1892-1930); the G. W. Hume Company cannery at Turlock, California (R.III, 2157-2192).

operating engineers with experienced backgrounds in operating water systems and related equipment. They came from various parts of the country and, as noted above, represented all segments of the economy, ranging from Federal and State agencies through scores of nationally known concerns down to the individual proprietor operating his own cleaning establishment. Testimony of successful performance came from representatives of such informed buyers and users as the United States Post Office Department (R. IV, 2325-2340; 2677-2687), the United States Navy Department (R. IV, 2688-2703; 2704-2718), the General Services Administration of the United States Government (R. IV, 2677-2687), G. W. Hume Company (R. III, 2157-2192), Bridgford Packing Company (R. III, 1892-1930), American Rock Wool Corporation (R. IV, 3077-3089), the Fresno Bee (R. IV, 2292-2296; 2307-2325; 2296-2307), Central Valley Ice Company (R. IV, 2268-2291), North Pacific Plywood Company (R. IV, 3220-3226), St. Joseph's Hospital (R. IV, 3339-3349), Knott's Berry Farm (R. III, 1804-1839), Union Ice Company (R. III, 1931-1963), Buffum's Department Store (R. III, 1839-1891), The Harris Company (R. III, 1976-2011), Pacific Western Oil Corporation (the producing company for Tidewater Associated Oil Company) (R. III, 2145-2155), Three States Natural Gas Company (R. V, 3564-3581), Rowan Oil Company (R. V, 3705-3723), Delta Gulf Drilling Company (R. V, 3436-3450), Bercut-Richards Packing Company (R. IV, 2536-2551), Roy Guffy Drilling Co. (R. V, 3409-3436), Helmerich & Payne, Inc. (R. V, 3518-3529; 3543-3558), Pope & Talbot, Inc. (R. IV, 2388-2412; 3397-3405; R. VI, 1131-1161), Union Oil Company (R. VI, 1066-

1099), American President Lines (R. IV, 2748-2763), Transoceanic Marine Corporation (R. IV, 2637-2663), Waterman Corporation of California (R. IV, 2672-2677; R. VI, 1026-1062), American Mail Line (R. IV, 3392-3397), United Fruit Company (R. VI, 1066-1099), and Nehi Bottling Co. (R. III, 2129-2137).

In Appendix B to this brief we set out the names and the occupations of petitioners' witnesses (with record references to their testimony). A mere glance at this list discloses the force and integrity of the testimony presented. Virtually every witness was concerned with the control and solution of water problems as an important and integral part of the business or industry in which he was engaged. In most instances the witness had the direct responsibility for the proper, efficient and economic maintenance and operation of the water system involved. The testimony of every witness was that substantial, and in most cases exceptional, benefits resulted from the use of the Evis unit—benefits which could be and were observed objectively. In a number of instances demonstrative proof, consisting of actual samples taken from the water systems, was brought into the court room.³¹

³¹Sections of pipe showing removal of scale produced by Jack F. Manney, Jr., shop planner at the United States Naval Ammunition Depot at Mare Island, California (RX 49A and B, R.VI, 1018; 2-5/6168-1; R.IV, 2692-2693); sections of pipe produced by Paul H. Ralston, San Mateo, California, branch manager, Cook's Oil Company (RX 50A and B, R.VI, 1019, 2-5/6168-1; R.IV, 2880); samples of scale removed from coffee urns produced by Walter Knott, founder and owner of Knott's Berry Farm, Buena Park, California (R.III, 1028-1032); samples of scale removed from three 100-ton evaporative condensers at Buffum's Department Store at Santa Ana, California (R.III, 1849-1853); samples of scale removed from a 250 horsepower boiler at the plant of American Rock Wool Corporation, Tacoma, Washington (R.IV, 3081-3084).

The force of the testimony can be appreciated only by an actual look at what the witnesses said, and earnestly we ask the Court to consider but a few pages quoted from the many thousands before it. For example:

Mr. Shepard, chief of the construction and supervision branch, Public Building Service, General Services Administration of the United States, who is responsible for the mechanical equipment in all Federally owned and operated buildings in California, Nevada, Arizona and Hawaii (R. IV, 2678), testified (R. IV, 2680-2683):

“Q. How many units of the Evis Water Conditioner do you have installed in various Government properties?

A. Well, let's see. I would say about 11 or 12.

Q. Now, can you tell us where those units are located?

A. Well, we have four in Fresno, one in the Border Station at San Ysidro, California, two in the Tucson, Arizona Post Office, one in the Colusa, California Post Office, one in the Brawley, California Post Office, and one in the Calexico Border Station, and one in the Calexico, California Post Office. That's all I recall at the present time. There may be one or two others; I can't remember.

* * * * *

Q. * * * Can you just tell us briefly what the problem was before the installation of the [first] Evis and then what happened after it was installed?

A. In the Fresno Post Office we have what we call an evaporative type air conditioning system and its refrigeration. We circulate the water through cooling coils through various systems in the building. The water is cooled by evaporation and a large amount of water is used, passing through the cooling coils. It's

cooled and re-cooled and recirculated. That was where we had the problem with the water.

Q. And how did that problem evidence itself, so far as the equipment was concerned?

A. Well, from the very beginning when the system was installed in 1940 * * * we had trouble with formation of a flinty, hard scale in the tubes, which necessitated the annual cleaning of these tubes by manual labor. The fact is, the substance was so hard we had to drill it out with an electric drill * * *.

* * * * *

A. * * * I believe it was in 1953 that I installed the first Evis Conditioner on the makeup line to the air washers, to one of the air washers. I installed this to test it to see what it would do, to see if it would improve the condition. * * *

* * * * *

Q. Well, just tell us what condition you have observed after the installation.

A. Well, I looked on the inside of the coils and the—while the scale had not entirely disappeared, it had softened to a point where it could be easily cleaned out. It wasn't necessary to use the electric drill."

Mr. Shepard further testified that during 1953 the other identical air washers in the building were operated without Evis units and continued to form flinty hard scale; that he installed units on these washers in 1954 and immediately experienced the same beneficial results; that as a result of this experience in Fresno he recommended installations in the many other Federal buildings mentioned in his testimony (R. IV, 2682-2683).

It is more than a matter of interest that it was in this very building, the Federal Court House and Post Office Building in Fresno, that the Hearing Examiner (who twice held that the Commission had failed to sustain the charges in its complaint) took Mr. Shepard's testimony, the testimony of Mr. Crosby, his Superintending Engineer, and that of other witnesses.

Mr. Manney, a shop planner in the Naval Ammunition Depot at Mare Island, California, testified to the removal of heavy scale incrustations in water pipes installed in Government quarters (R. IV, 2693):

“A. * * * Frankly we were amazed or I was. I was amazed when I took the piece of pipe out.

* * * * *

A. After this sample conditioner was used, we purchased three and—I mean there were three that was installed at the wash house.”

Mr. Westwick, a marine engineer for 32 years, testified as to his experience with an evaporator on the Pope & Talbot steamship “Explorer” (R. IV, 2394):

“Q. Now, I am thinking now of the exact condition of the evaporator when you first installed the Evis. Was it then clean or was it scaled?

A. No. It was very dirty and I asked if I should clean it first and he said, no, just install the Evis Conditioner and I did.

Q. And what happened after you installed the Evis Conditioner?

A. Well, about three days later, we had to shut her down, open her up for inspection, and here all the scale was laying down on the bottom of the evaporator eight inches deep.

* * * * *

Q. What did you do then?

A. Just scraped it off and started it up again.

Q. Did you do anything further to clean the tubes?

A. No. We let her go for about eight months, I believe it was, because we were getting results. We didn't have to worry about it. Then we opened it for inspection and the tubes were clean, or the coils rather, were clean."

Mr. Deppman, superintending engineer for the Waterman Steamship Corporation, testified in regard to salt water evaporators (R. IV, 2674-2675):

"A. I think we have 16 or 18 or 19 ships equipped with one or more units.

Q. And over what period of time approximately have those ships been using the Evis Water Conditioner?

A. Oh, I don't know. I'd say around three and a half years, maybe.

Q. And on what type of equipment on board ship are the Evis Water Conditioners generally installed?

A. On the makeup and contaminated salt water evaporators.

Q. Now, prior to the installation of the Evis Water Conditioner on these ships, state whether or not it was necessary in the ordinary maintenance of the evaporator equipment to use acids in cleaning and maintenance.

A. We used acids on some of the ships and other of the ships, it was all manual cleaning, hand scaling, every four or five days.

Q. Now, since the installation of the Evis Water Conditioner has there been a continued use of acids or has that been eliminated?

A. I haven't ordered a gallon of acid in the last two and a half or three years, I would say, for any of my ships that are under my jurisdiction."

Mr. Gardner, vice president of Delta Gulf Drilling Company, testified in regard to five Evis units installed on the Company's drilling rigs (R. V, 3440-3441):

"A. * * *

We had been operating, I presume, for about three years a large steam rig in a field known as Chachoula. It is located down in Thibodeaux, Louisiana. * * * we had been drilling 14,000-foot wells for the Sun Oil Company. * * *

* * * the only water we could use was out of the swamp, and it was just as black as ink and was filled with salt minerals of various kinds and organic material. * * *

We had so much trouble with boilers, those wells would take three months or more to drill, and we were spending all the way from five to eight thousand dollars a well on chemical treatment and boiler maintenance. * * * we even, in spite of all we could do, had to junk one set of boilers and replace them with another * * *

* * * * *

A. On that particular rig we had four 150 pound super-heated boilers.

* * * I heard of this Evis Conditioner and * * * we installed that rather skeptically, I have to admit, on a lot of our parts, but we put it on, and in a period of time, I don't recall how long, the scale loosened and came—we blew it on out of the boilers, and I can attest to the fact that there was a big pile of scale down there and the boilers went ahead and cleaned up, and I personally saw them after the conclusion

of our final well at Chachoula, and I think we drilled two after we put that on, and I could see no scale in the boilers through the hand hole plates and various places where you can inspect.

Now, on the strength of that, we put Evis Conditioners on all of our steam rigs on the Gulf Coast.”

Mr. Smith, maintenance foreman for Guy Mabee Drilling Company, testified as to the operation of an Evis unit on a water-cooled drilling rig (R. V, 3599, 3603-3605):

“Q. Now, what experience have you had with the cooling of the cylinder chambers since you installed the Evis water conditioners?

A. Well, I’ll tell you, the rings last longer in those engines and they operate a lot longer since we have put those Evis’ on there.

* * * * *

Q. Now, in the typical operation of a Waukesha engine on a big rig, in your experience, how long would it take to get a liner into that condition so it would have to be junked?

A. Well, in certain instances, it wouldn’t take over a period of 90 days.

* * * * *

Q. Well, assume you have one of your better waters. * * *

* * * * *

Q. How long would they go sometimes?

A. Oh, I would say they would run six months.

Q. What is your experience with the Waukesha engines today with your Evis water conditioners installed?

A. I tore one down here about three months ago and I put the same liners back in it that had been running for about three years.

* * * * *

Q. Can you give us any estimate of the amount of saving in man hours and repair and replacement that you have experienced with the Evis water conditioners?

A. I'd say we'd cut our maintenance down on our water system, oh, two-thirds.

* * * * *

Q. Now, what has been your experience with the brakes on the rigs?

A. Well, complete stoppage of circulating of water on the brakes in my experience.

Q. And have you had trouble with those brakes since you installed Evis water conditioners?

A. I used to before I put those Evis' on there. I would have to acidize those drums at least once a year and I have never acidized them since I put them on [a period of three years]."

Mr. McCartney, district superintendent for Three States Natural Gas Company, Dallas, Texas, testified in regard to the operation of three Evis units installed on oil well equipment (R. V, 3567):

"A. * * * on one particular well we had at Talco, Texas, it is a Paluxy well, production from Paluxy zone, about 4350 feet, prior to the time we installed the Evis conditioner to treat corrosion in the hole, in the well, and we installed an Evis conditioner, sometime in August of '53 on that one particular well, Hargrove No. 5, we were having to pull that well due to corrosion and revolving seats of the pump and we were having a little rod trouble there, on an average of twice a week we had to pull this well to take care of it. We installed this Evis conditioner on the bottom of two and a half tubing and after the installation of the Evis conditioner, we pulled

that well twice within the past two years, and both times we pulled the well just merely to check the seats to see what condition they were in and we found no signs of corrosion.”

Mr. Durst, a consulting petroleum engineer, partner in the firm of Gruy & Durst of Fort Worth, Texas, testified that before installing an Evis unit on equipment for oil well drilling rigs it was necessary to remove the equipment from service every three months and chip out accumulated scale. He further testified (R. V, 3710):

“For the six months’ period following the installation of the Evis Conditioner, the treater operated normally and there was no necessity of cleaning the treater out. * * * I did visit the lease to see how this particular piece of equipment was working, because it seemed sort of a phenomenal thing to me, and I took a piece of screen wire, held it * * * under the bleeder line and collected in a matter of 10 or 15 minutes about a handful of particles of scale. I say particles; they were chunks about the size of the end of my thumb, and these chunks were soft, about the consistency of jello; they could be easily mashed. The treater operated satisfactorily up to that time without any need for shutdown or clean-out at all.”

On cross-examination Mr. Durst, who is a graduate engineer, added the following cogent remarks (R. V, 3720, 3721-3722):

“Q. Do you know the principle by which the Evis Water Conditioner works?

A. I have no idea. I am extremely curious.

* * * * *

Q. And you attribute this action solely to the Evis Water Conditioner to the exclusion of anything else,

that there was nothing else present that could possibly have caused this prevention of scale except the Evis Water Conditioner?

A. That is correct.

* * * * *

THE WITNESS: May I add one little statement to that. It is an inconceivable thing that the Evis Conditioner does work. It was always a question in my mind and I rather compare it to the bumblebee; that aerodynamically he can't fly."

Mr. Knott, owner and operator of the world-renowned Knott's Berry Farm, one of the largest restaurants in the world (with its accompanying plant for preserving fruits), employing 800 people and serving more than a million and a quarter meals a year (R. III, 1805-1807), testified (R. III, 1811-1817):

"A. Well, of course, as everybody who uses and heats water, they have certain problems. And when they came along and assured us they could correct these problems, we were very skeptical, and, in fact, at first we refused to even be bothered about putting in as preposterous a looking thing as this. But after they offered to put it on, stand all the cost of putting it on, and leave it for a trial, we went ahead on a 90-day trial.

* * * * *

Q. And what was the size of that first unit?

A. I believe they called it the six-inch unit. * * *

Q. And do you recall offhand the cost of the unit?

A. I couldn't give it to you in exact dollars, but in round figures, about a thousand dollars.

Q. And on the basis of the 90-day trial period you had, you were satisfied enough had been demonstrated to you to warrant that investment?

A. Yes, sir, or we wouldn't have made it, most certainly.

* * * * *

A. I think we had about the same problem everybody has with evaporative condensers. The minerals out of the water condense around the tubes that carry the hot liquid that comes back from the refrigerator or from your compressors * * *.

* * * * *

A. The tubes were three-quarters of an inch, and they would build out about a quarter of an inch thick of this lime, and their cooling action would be very much retarded because of the insulation this lime or mineral on the tubes would cause, and they would have to be cleaned.

* * * * *

Q. Now, when this quantity of lime scale would build up on these tubes, would it be a hard scale?

A. Yes, it would be hard.

* * * * *

* * * you couldn't take a steel brush and get it off. It has to be either broken off by hammering or it has to be cut off with acid.

* * * * *

* * * but we tried very hard to use enough water treatment in the water to prevent that having to be done.

* * * * *

* * * we used softened water to begin with, but we were still having to add chemicals to prevent the scales from forming, and still we were not succeeding.

Q. * * * after the installation of the Evis water conditioner, what has been your experience with that particular unit so far as this problem is concerned?

A. We discontinued using any chemicals in the water, and the lime has gradually softened and left the

coils, and, for this last year, we have used absolutely no chemical at all, and the coils are completely clean.”

Mr. Waldman, a partner in the Dallas City Packing Company, testified (R. V, 3619) :

“Q. Do I understand correctly that every drop of water that goes into the plant goes through the Evis Water Conditioner?

A. That’s right.

Q. What has been your experience with it in the past three years?

A. Well, it has reduced our corrosion problem to what I would call a minimum.

Q. And your answer applies to every type of line throughout the plant and the equipment that is involved therein?

A. Yes, valves and lines and flues.”

Mr. Shaw, manager of a department store in Santa Ana with three 100-ton evaporative condensers, testified (R. III, 1863) :

“A. The scale flaked off and loosened to the point where we could lift it off with a spatula, and a little bit of effort. At that time, we were convinced the Evis was doing the job. We were no longer interested in testing. We were only interested in getting the scale off. So, we removed it as fast as we could. No new scale has formed.”

And (R. III, 1872) :

“After we put in your Evis, I would say 60 days later, we went into it again. This particular time that we went into it, the holes were open. They hadn’t become plugged * * *. We haven’t had any trouble

since with our deposit taking on the baffle and nor have we had any trouble with the holes plugging up.”

Mr. Shane, engineer for the American Rock Wool Corporation plant at Tacoma, Washington, testified (R. IV, 3081-3082):

“Q. Now, what changes, if any, did you note in the boiler scale after the Evis was installed?

A. Well, we noticed a distinct softening and sloughing off of the scale * * * we opened the boiler up thirty days after we put the Evis in to see what it was doing, and it had started to soften the scale up at that time. Then we opened it again in ninety days after, and it was still improving, and we opened it every six months in the general routine opening, and we had it opened again about three weeks ago, and there was very little scale left. It was very thin and soft.”

Mr. Rogers, plant foreman for the Nehi Bottling Company, of Orange, California, testified (R. III, 2132-2133):

“Q. And with this chemical water softener in operation [prior to the installation of the Evis unit], did you have any scaling problems in the equipment, the soaker, or any of the washing or bottling equipment?

A. Yes, we did with the water softener. We had scale. Scale built up every once in a while. We would have to—well, I would say probably once a week, we would have to take out the jets and clean them off because they would become stopped up from scale.

* * * * *

Q. Since * * * [you installed the Evis approximately three-and-a-half years ago] what, if any,

changes have you noted in the condition of the scale on the equipment?

A. The scale has, well, our machine today has no buildup at all on the chain itself. There is still some in the corners, of the previous scale, but it is soft. It has become soft, so it is easy to remove."

Mr. Wiborg, in charge of steam equipment for Dickman Lumber Company in Tacoma, Washington, testified (R. IV, 3103-3106):

"Q. Before it was installed * * * what was the condition of your boilers in your normal experience so far as scale is concerned?

A. It scaled up in spite of our compounds.

* * * * *

Q. What happened to your scaling condition in the boilers after the Evis Water Conditioner was installed?

A. It gradually diminished.

* * * * *

The old scale isn't there any more.

* * * * *

Q. And what have you done so far as the use of boiler compound is concerned?

A. Discontinued."

Mr. Ryan, chief engineer and maintenance man for Leybold-Smith Shingle Company in Tacoma, Washington, testified (R. IV, 3135):

"Q. Now, Mr. Ryan, after the installation of the Evis Water Conditioner, what change, if any, did you notice in the boiler?

A. Well, I have noticed that I haven't got nearly the scale that I had accumulated before, but other than that, there has been hard scale that has accumu-

lated in the past years at a time, and this let loose and it has come out, and there hasn't been any build-up, because I check that approximately every two weeks."

Mr. Howard, port engineer for the American Mail Line in Seattle, Washington, testified (R. IV, 3393-3394):

"Q. Before the installation of the Evis water conditioners on these vessels, what was your customary practice with respect to cleaning the boilers?

A. They were cleaned, I would say, about every two weeks, and about every second trip the tubes had to be taken ashore and straightened out and put back again, and some had to be boiled out in order to get the scum off of them. They were all beat up with wooden hammers, or with whatever they used on the ships to do it with.

Q. What change, if any, have you noticed in your maintenance problems on the coils in the evaporators since the Evis water conditioners were installed?

A. Well, we haven't had them ashore since we put them on there.

The scale that forms there now is very soft, and it can be washed off. * * *

Q. Do you know whether other ships in the American Mail Line are also equipped with Evis water conditioners?

A. All of the American Mail Line ships are equipped."

Testimony similar to the foregoing could be quoted endlessly. Other marine engineers of long experience gave depositions at the ports of San Francisco, Oakland, Alameda and Oleum, California. Without exception, they testified that prior to the installation of Evis units serious

water-scale problems had been encountered in evaporators aboard their ships which demanded the use of large quantities of chemical solvents, and also required a great deal of labor in hammering, chipping and drilling; that these expenditures of materials and labor had been almost entirely eliminated by the installation of Evis units (R. IV, 2388-2412; 2637-2663, 3168-3178; RX 55, 56, 57, 58, R. VI, 1026-1065; 1066-1099; 1100-1129; 1131-1161).

In regard to the important problem of the prevention and removal of scale, 88 witnesses testified to the successful performance of 225 Evis units in the prevention of scale formation; 63 witnesses testified to the performance of 168 units in the removal of old scale deposits, including 43 Evis units which had benefited 74 boilers; 26 witnesses testified that 57 Evis units had benefited 99 installations of air conditioning and refrigeration equipment; 5 witnesses testified to successful results obtained with 55 units on 65 oil well drilling engine radiators and cooling lines; 68 units were shown to have been effective in preventing scale in various types of water heaters, urns, washers and marine evaporators; and 46 units had been beneficial in preventing scale in piping systems, nozzles, spray jets, various types of valves, and other miscellaneous uses. (See Appendix C to this brief where we set out a complete statistical analysis of the testimony concerning the prevention and removal of scale.)

In addition, numerous witnesses testified to other benefits derived from the treatment of water by the Evis unit in the other respects challenged by the Commission.

Fourteen witnesses testified to improvement of agricultural growth, leaching alkali from soils, prevention

and removal of deposits on leaves of plants, and inhibition of algae growth (see Appendix D to this brief).

Seven witnesses testified to the improvement in odor or taste of water, or improvement in the taste of coffee (see Appendix E to this brief).

Seventeen witnesses testified to the effective use of the Evis unit in the removal of grease from drains, the preventing of various types of stains and scums and the retarding of pitting of metal (see Appendix F to this brief).

Eighteen witnesses testified to benefits in laundry uses and efficiency of soap (see Appendix G to this brief).³²

Not a word contradicts the testimony of these witnesses.

A truly dramatic instance of the effect of the Evis unit upon laundry operations was that described by the manager of the Rainier State School at Buckley, Washington. There, mentally retarded children who worked in the laundry were "trained to put just a measured amount of soap in a washing machine, [so that] once they have acquired that habit, * * * they will do it almost automatically" (R. IV, 3383). On the morning after the Evis unit was installed the washers were "boiling soap suds all over the place" before the operator could reduce the amount of soap used (R. IV, 3382).

As opposed to the foregoing the Commission did not introduce a single word of testimony concerning the Evis

³²These witnesses included two experts who performed a series of tests at the Peninsula Laboratories, Mountain View, California. The units used were properly installed, and rigid controls were maintained. The tests showed that, with the Evis unit, soap consumption was reduced 20 per cent, one-third less rinse water was required, and the residue of grease and lint which collected in the washing machine was reduced 50 per cent (R. IV, 2508, 2511, 3256, 3276, 3277).

unit in actual operation and use by members of the public. Instead it relied entirely upon the testimony of so-called expert witnesses. Five of these experts³³ testified to spectrographic and photomicrographic tests of the metal in the Evis unit. Since these tests were addressed entirely to the metal's physical composition, and since both the Hearing Examiner and the Commission held that this testimony failed to sustain the charge that the unit is not made of specially processed metal, we make no further mention of the testimony of these witnesses.

The remaining witnesses (with the exception noted at pp. 40 to 45, *infra*), testified concerning laboratory tests each had made upon water treated by the Evis unit. The tests were wholly artificial, either having no relevance to any claim made by petitioners, or conducted under laboratory conditions so alien to actual operating conditions as to have no probative value (see pp. 31 to 40, *infra*). On the basis of these tests alone—and with no consideration at all of what the Evis unit had accomplished in actual use—each gave his expert opinion.

Further, unlikely as it may seem, every one of these experts, with the single exception of Dr. Allison (whose results uniformly showed benefits from the use of the Evis unit, pp. 36 to 38, *infra*), failed to install and use the Evis unit in accordance with the manufacturer's instructions. Their failure in this regard was not harmless oversight, but so vital as to vitiate their conclusions (see pp. 44 to 47, *infra*). Not one of the experts save Dr. Allison sought instructions or assistance from the manufacturer. Indeed, in

³³Messrs. Abbitt, McBurney, Corfield, Czyzewski and Uman (R. II, 705, 358, 362, 925, 89).

the only two instances where petitioners knew that tests were being conducted and tendered their engineers to advise and assist in the installation and operation of the equipment, the offers were refused (R. II, 813; III, 1266-1267), in one case so contemptuously³⁴ that the Hearing Examiner held, on the basis of this occurrence and others, that the witness entered upon and conducted his so-called scientific tests with a preconceived opinion that the Evis unit was worthless, that his denial of a prejudgment of the merits was so evasive as to be unworthy of belief, and that "the factual content [of his testimony] is too intermingled and clouded with evasions, qualifications and attempted explanations" to constitute substantial evidence (R. I, 718-719).³⁵

One of numerous instances which illustrates the total unreality of these laboratory tests is the case of Dr. Hoffman of the Bureau of Standards, the Commission's principal witness. Under cross-examination he testified that during his laboratory tests he visited the Experiment Station of the Department of Agriculture at nearby Beltsville, Maryland, and saw a unit in operation (R. III, 1202). When asked whether it was not a fact that the unit was working successfully, he replied (R. III, 1204):

"I am a little reluctant to go into the installations in another department, if I can avoid it. It does not

³⁴Dr. Albrook of Washington State College. See especially R. II, 717-740.

³⁵The associate of this witness, Dr. Adams, was relieved by his superior at Washington State College from further investigation of the Evis unit because of his "personal bias in the matter of conducting tests" (Decision of the Hearing Examiner, R.I, 718).

concern my tests any more than the mere inspection to see whether it was grounded.”

At this point the Hearing Examiner sustained objections to any further questioning of Dr. Hoffman concerning this installation (R. III, 1204-1207). After petitioners had made offers of proof, however (R. III, 1207-1208), the Examiner modified his ruling (R. III, 1237) and thereafter Dr. Hoffman testified (R. III, 1339-1340):

“Q. Yesterday there was reference to the installation of the Evis unit at the United States Department of Agriculture Station at Beltsville—do you recall that?

A. I recall it.

Q. You were out there and examined that installation, did you not?

A. I was out there.

Q. You did not see the installation?

A. I saw it, the installation.

Q. There were two evaporator condensers, were there not?

A. There were.

Q. On one of which there was an Evis unit?

A. Yes.

Q. On the other there was not an Evis unit?

A. That is correct.

Q. And you observed, did you, Doctor, that the Evis unit was clean as compared with the non-Evis unit which was scaled?

A. I saw that, yes, sir.

Q. And you were advised, were you not, by the personnel at the station that in the case of the Evis unit they had at that time been able to operate it for eight weeks without cleaning as distinguished from their prior practice of cleaning it every 10 days to 2 weeks?

A. I was not so advised, but * * * I overheard this statement made.

Q. You were present, were you not?

A. I was present."

Dr. Hoffman was then further cross-examined (R. III, 1340-1343):

"Q. Now, Doctor, have you also had an opportunity to personally inspect other installations on United States Government property of Evis units?

A. I was over to the Old Dominion Building, I believe it is called, in Arlington, to see an installation there.

* * * * *

Q. That installation, Doctor, in that did you observe that this cooling unit * * * had de-scaled with the Evis unit?

A. I saw the unit only once. The unit had parts of the pipes where scale had broken off and was lying in the bottom. I know nothing about the history of it or what caused that to fall off. I could not make any positive statements as to the value of the water treatment.

Q. In the course of your inspection at that building did you make inquiry of the operating personnel there as to what the conditions had been before and after the installation of the Evis unit?

A. I forget whether I made any inquiry. I was there mainly to see the grounding system that they were using. * * *

* * * * *

Q. I see. The fact that the unit was de-scaling there and you saw evidence of that in your opinion carried no weight one way or the other, Doctor, is that it?

A. I have to base that—I hope you understand—on the fact that I did not see another one close by under the same circumstances which did not have an Evis conditioner on it.

Q. All right.

A. I must hold to that.

Q. * * *

Had it come to your attention prior to the time that you made this visit that there had been a scaling problem at this particular building and that the problem was being helped by the Evis unit, in other words, Doctor, perhaps I should ask you first, how was it that you happened to make this inspection?

A. Somehow I learned that a unit was installed there. This, I believe, is evidence that they had a scaling problem, and then knowing that the unit was there I believe I took the initiative in calling and asking to see how the grounding was done. I believe those are the honest facts.

Q. Doctor, are you aware * * * that there are a number of Evis installations at other Government stations or buildings?

A. I have heard that there were, but I have made no note of them and I would not know where they are.”

And yet Dr. Hoffman gave his opinion in these proceedings on the basis of completely irrelevant, misconducted and artificial laboratory tests. In reaching this opinion he totally disregarded the actual functioning of Evis units under normal operating conditions in Government buildings within a few miles of his laboratory; he took no interest in, and made no inquiry concerning, other Government installations of which he had knowledge.

It is of this witness that the Commission, in the decision under review, says (R. I, 811):

“Dr. James Irvin Hoffman, Chief of the Surface Chemistry Section and Assistant Chief of the Chemistry Division of the National Bureau of Standards * * * testified that based upon his scientific knowledge and the experience he had had with the Evis Water Conditioner, it could have no effect upon water.”

The Commission’s expert testimony was as follows:

Eight experts made soap hardness or similar tests which proved that Evis treated water did not differ chemically from untreated water.³⁶ This proved exactly what petitioners have represented. Over and over the Evis literature states that the unit does not change the chemical composition of water (CX 8, R. VI, 827; CX 27, R. VI, 879, 881; CX 31, R. VI, 896, 899). When the testimony of the eighth of these witnesses was offered by the Commission, the Hearing Examiner finally inquired (R. V, 3952):

“May I ask you, what is the relevancy, since there is no claim of chemical change resulting from the use of an Evis? What is the purpose of showing the chemical analyses?”

Four of the witnesses³⁷ performed “dry scale” tests, a test similar to putting a teakettle on the stove, boiling it dry and then measuring the solids deposited on its walls.³⁸

³⁶Merrell (R.II, 8), Carty (R.II, 110), Kleiner (R.II, 328), de Bussieres (R.II, 479), Benezra (R.II, 559), Albrook (R.II, 584), Adams (R.II, 846) and Gildea (R.V, 3947-3953).

³⁷Mallory (R.II, 135-138), de Bussieres (R.II, 479), Benezra (R.II, 559), and Johnson (R.V, 3793).

³⁸Since the issue of scale is so important in this case, we discuss these tests further in our argument (pp. 67-70, *infra*).

Petitioners have never represented that the Evis unit removes solids from water. No water treatment can do this. The function of water treatments is to affect the solids in water, physically or chemically, so that in operation they are flushed out with waste water or, in the case of a closed circulating system (such as that described by Mr. Shepard, *supra*, pp. 10 to 12), are deposited in a soft and readily removable form rather than as flinty scale. The Commission's own witness, Dr. Hoffman of the Bureau of Standards, characterized these dry-scale tests as "irrelevant * * * There was no sense in burdening the hearing with those experiments" (R. III, 1215).

Commission witness Merrell put odor-bearing water in two beakers, added Evis treated water to one and untreated water to the other⁹ and "sniffed" each sample. He detected no difference (R. II, 15).³⁹

The same witness filled one beaker with treated water and one with untreated water, let each stand 30 days, and then noted that each seemed to have the same amount of dust and scum on top (R. II, 15). From this he concluded that the Evis unit does not "keep drains and sumps free from scum." On cross-examination he finally characterized his own experiment as "a very weak test * * * just cooked up to disprove that one statement that was made in the literature" (R. II, 70).

To disprove petitioners' claim that the Evis unit "aids operation of base exchange softeners" the same witness passed a little more than 16 quarts of both treated and

³⁹In direct violation of petitioners' specific instruction not to mix treated and untreated water (CX 31, R.VI, 898).

untreated water over two ounces of ion exchange material (see pp. 55 to 56, *infra*, for a description of the ion exchange process) and analyzed the water at the conclusion of the experiment (R. II, 12). The experiment took about three hours (R. II, 51). The normal cycle of base exchange softeners in actual operation is from two to four weeks (R. II, 51). Dr. Adams (see footnote 36, *supra*), testing for the same purpose, dripped water over ion exchange columns for periods ranging from a little over seven hours to 30 hours.

Of these tests the Hearing Examiner said (R. I, 724):
 “Witness Merrell’s experiment lasted about three hours, and Witness Adams’ tests ranged from 430 minutes (seven hours and ten minutes) to thirty hours. It was shown that the normal operating cycle of a base-exchange softener is at least two to four weeks. It would appear, therefore, that neither experiment was conducted in a manner at all comparable to the practical operation of a base-exchange softener * * *.”

Witnesses Mallory and Benezra rinsed glasses in Evis treated and untreated water, let them dry and said they could observe no difference (R. II, 145, 576-577).

Witness de Bussieres found that both treated and untreated water froze at the same temperature; that the conductivity of each was the same (R. II, 478-479). Neither test was shown to have the faintest bearing on any Evis claim or to be related in any way to the performance of the unit in actual operation.

Witness Wagner made infrared spectro-analyses of treated and untreated water, testing for an “alteration in the molecular structure, the geometrical configuration of

the molecules'' in the water (R. II, 888). His spectrograms showed only the molecular structure of the water and disclosed nothing concerning the solids in it or the form in which they occurred (R. II, 889, 893). His test could have not the slightest relevance to the claims of petitioners that the Evis unit affects the solids in water in such a way as to achieve the demonstrated beneficial results.

Dr. Hoffman, to whom we have referred (*supra*, pp. 27 to 31), made a surface tension test of treated and untreated water and found no difference. Petitioners have never represented that the Evis unit affects the surface tension of water. But Dr. Hoffman sought to relate his test to the representation of petitioners that the Evis unit affects the behavior of water at the interface, i.e., its point of contact with metal or other substances. He testified on direct examination (R. III, 1118):

''A. Any change in the behavior in water at the interface must be accompanied by a change in the surface tension.''

The cross-examination of Dr. Hoffman after this categorical statement is illuminating. First, after long, critical and even embarrassing examination, he admitted that his surface tension test had been incorrectly conducted and for that reason ''should be summarily discarded as valueless'' (R. III, 1360, 1362). He then admitted that in fact the surface tension test was not a conclusive test of ''the effect of Evis on water'' (R. III, 1369):

''Q. Do I understand from your testimony that you feel that the tension test is a final and conclusive test as to the possibility of Evis' effect upon water,

having in mind that the water as we have just said passes through the pipe and through the Evis is in contact with a solid, whereas on the other hand in the tension test you have the isolated water not being in contact with the pipe or the Evis itself?

* * * * *

A. I would say no.”

He then specifically recanted his original testimony (R. III, 1371):

“Q. * * * [Does] the surface tension test * * * necessarily demonstrate the characteristics of that water when it comes in contact with a solid.

A. Not completely.”

And finally he admitted that a change in the physical characteristics of water would not necessarily have to be accompanied by a change in surface tension (R. III, 1312):

“* * * Let me ask you this. Would a change in the physical characteristics of water, any change, necessarily * * * have to be accompanied by a change in surface tension?

A. No, sir.

Q. In other words, Doctor, there could be some changes in physical properties of water without a corresponding change in surface tension?

A. That is correct.”

Further, with reference to petitioners’ claim that the processing of the Evis unit affects the crystalline structure of the metal, which in turn affects the behavior of water, he conceded (R. III, 1315):

“Q. Now, Doctor, are you familiar with the fact that the angle of contact of water may be affected by

the crystalline structure of a piece of metal such as brass?

A. Yes, sir.

Q. You know that?

A. Oh, yes.

Q. Are you familiar with the fact that the same is true in the case of iron?

A. I presume it is."

Dr. Allison conducted a number of tests to determine, in his language, "what effect [the Evis unit] had on soil properties and plant growth" (R. II, 236-237). The "soil" he used—a finely separated, graded and aerated soil (R. II, 253)—bore no relation to soil encountered in actual farming operations. His test for plant growth consisted of observing corn seedlings grow for seven weeks in 12 flower pots in a greenhouse, and his tests on soil were performed on small laboratory quantities. And yet, even under these conditions, Dr. Allison's records, when produced on cross-examination (R. II, 257-258), showed:

(1) The corn plants irrigated with Evis treated water averaged one inch higher in growth—30 inches as compared to 29 inches (R. II, 289).

(2) In a test to determine the penetration of water into the soil the Evis treated water penetrated to a depth of .114 centimeter as compared with .108 for untreated water (R. II, 267-268).

(3) In a test to determine the effect of water upon the alkalinity of the soil the Evis treated water reduced alkalinity from a pH 9.3 to 8.7, or a difference of .6, while untreated water reduced the alka-

linity from 9.3 to 8.9, or a difference of .4. Dr. Allison testified (R. II, 295):

“Q. So the difference in the change in the case of the Evis treated soil was half again as large as the difference in alkalinity of the soil that did not receive the Evis treated water, is that correct?

* * * * *

A. That is correct.”

(4) In an electrical conductivity test (which discloses the salinity of the soil) the Evis treated water reduced the rate from 3.80 to .99, a difference of 2.81, whereas untreated water reduced the rate from 3.80 to 1.32, a difference of 2.48 (R. II, 298).

(5) In a moisture retention test the soil irrigated with Evis treated water contained 26.0 atmospheres of water compared with 25.6 atmospheres with untreated water. Dr. Allison testified (R. II, 281):

“Q. So that there was in this particular instance, in the case of the Evis treated water, it showed a greater degree of moisture retention than did the untreated water, is that not correct?

A. Well, according to the figures there is a slight difference.”

(6) In a test to determine the exchange sodium potential of soil the Evis treated water reduced the potential from 48 to 14, whereas untreated water reduced the potential from 48 to 15. Dr. Allison testified (R. II, 301):

“Q. * * * There is a difference between the rating of 14 in the case of Evis treated water as distinguished from the rating of 15 in the case of untreated water?

A. That is right.

Q. Nevertheless it is a change in a beneficial direction, is it not, doctor?

A. I would say it is a change and in a beneficial direction."

In short, each of these tests performed by Dr. Allison disclosed a beneficial difference in favor of water treated by the Evis unit.

In addition to the foregoing, the Commission introduced testimony of three laboratory tests designed to show that the Evis unit would not remove or prevent scale. Each of these tests is to be compared with actual operating conditions on the oil rigs, steamships, boilers, condensers, refrigerating equipment and other installations discussed in the testimony above quoted (and see pp. 67-70, *infra*).

The first of these tests was that of Mr. Merrell, who had "sniffed" the water and detected no difference, and who had admitted that his "test" for the prevention of scum was "just cooked up to deny that one statement" (*supra*, p. 32). He trickled treated and untreated water through two eight-inch sections of half-inch badly scaled pipe at the rate of a little more than a quart a minute for four weeks. At the conclusion of this "experiment" he weighed each section and found that each had lost one gram (R. II, 16).

Dr. Weast conducted the next experiment in Cleveland. For thirty weeks he flowed, at intervals approximately one hour apart, ten gallons of treated and untreated water through two parallel pipes heavily encrusted with deposits. Five times during the experiment he cut off short sections of pipe, split them longitudinally and photographed them

(R. III, 991; CX 51 and 52, 2-13/6168-1 and 2-14/6168-2). He found no observable removal of encrustation. Apart again from the dissimilarity of this experiment to actual operating conditions, and apart from Dr. Weast's failure properly to install the equipment (see p. *infra*, 46), Dr. Weast readily agreed that the deposits on the pipes with which he experimented were not the scale customarily encountered in water operations, but a mixture of scale and corrosion occasioned by the unusually high oxygen content of the water. Quite frankly he testified (R. III, 1008):

“Q. Would you say this [deposit on the pipes] was in the category of rust?

A. Yes.”

And again (R. III, 1073):

“Q. And turning back now to the corrosion question I asked you, would your experience here in Cleveland with similar problems lead you to believe that in this case you had primarily a corrosion of pipes as a result of the high oxygen content of the Cleveland water?

A. That is my opinion.”

And again (R. III, 1027):

“Q. Well, now, in the opinion that you rendered to the Hearing Examiner here as to the value of Evis in removing scale, would I be correct in assuming that that opinion was limited exclusively to the—what you have referred to as a ‘rusty type of scale’?

A. Yes.”

There is no representation anywhere in the Evis literature that the unit will remove encrustations resulting from

the corrosion of metals, as distinguished from ordinary scale deposited from the magnesiums, calciums and other solids customarily present in water.

The third test was made by Dr. Hoffman of the Bureau of Standards, to whose experiments we have referred above (supra, pp. 34 to 36). He took four sections of heavily encrusted pipe $2\frac{1}{2}$ inches long (R. III, 1132, 1231, 1296), baked them in a dry oven at 100° Centigrade for 30 minutes,⁴⁰ trickled about half a pint per minute of treated water through three sections, and of untreated water through one section, for a period of 68 days (R. III, 1133), found scale remaining in all four (R. III, 1137) and concluded that the Evis unit will not remove scale.⁴¹

Finally, the Commission relied on the testimony of Drs. Albrook and Adams at Washington State College. These are the witnesses to whose credibility we already have referred (supra, p. 27). Under their supervision two Evis units were installed on coffee urns serving the students on the Washington State campus. These two urns, plus a third one supplied by chemically treated water, and

⁴⁰A procedure which is quite inexplicable, is hardly to be expected in practical installations, and which made the calcium carbonate in the scale as hard as cement (R. VI, 2977).

⁴¹Quite apart from the obvious lack of any probative value in this "experiment", as compared to actual operating conditions, and quite apart from the fact that Dr. Hoffman's conclusion from his "experiment" was directly opposite to results which to his knowledge were being obtained under actual operating conditions in installations on Government buildings within a few miles of his laboratory (supra, pp. 27 to 31), the results of this experiment actually show a difference beneficial to the Evis unit. An examination of the photographs of the sections of pipe used in the experiment (CX 54 and 55; R. VI, 948-949, 951-952) shows a lessening of scale in the sections through which the Evis treated water trickled. (See especially the photographs of section No. 4 before and after the experiment, CX 54, R. VI, 948-949.)

a fourth one supplied with untreated water, were operated for five and one half months. They were then opened and inspected, and photographs of all four were introduced in evidence (CX 39, R. VI, 916). A mere inspection of these photographs on Commission's Exhibit 39 (pictures 1 and 4 are the Evis treated urns, picture 2 the water softener urn, and picture 3 the untreated urn) shows the extraordinary difference in favor of the Evis treated urns as compared with the untreated urn. It was the attempted explanation of this obvious result by Drs. Albrook and Adams (R. II, 596, 770-771; 851-853; 878), among other things, which led the Hearing Examiner to characterize their testimony as "too much intermingled and clouded with evasions, qualifications and attempted explanations" to constitute substantial evidence (R. I, 719).

Dr. Albrook, and his assistant, Mr. Flay, also testified concerning units installed on a coffee urn at the Hamburger King restaurant in Spokane, on a dishwasher at the Caravan Inn in Spokane, and on a hot water heater at the same Inn. Here again, although witness Flay said that he observed no difference, the demonstrative evidence clearly shows superior performance by the Evis unit. In the case of the coffee urn, after nine months of operation with an Evis unit the coils and the interior of the urn show a formation of a soft-type, readily removable scale, as compared to the hard, flintlike scale that had been deposited in the urn during four months of use prior to installation of the Evis unit (see photograph, CX 42, R. VI, 925), and the coils in the tank of the hot water heater with the Evis unit, after only 36 days of operation (R. II, 599-600), show definite descaling (see photograph, CX 41, R. VI, 922). As

to the dishwasher, witness Flay said that he went to the Inn from time to time and did not observe any difference in the glassware washed with treated and untreated water, and, generally, that there was no "apparent difference in the water on Evis treated water or raw water in the dishwashing" (R. II, 514). But when Dr. Albrook, on later cross-examination, produced the notes written by Flay at the time of his visits, the notes disclosed (R. II, 805):

"October 31, 1952 [one week after the Evis unit began functioning], talked to dish washer, and asked her whether or not she noticed anything different in the quality of water in the last week, and she said that the water seemed better, and that the water seemed better [sic], and the dishes apparently dried better, and that there seemed to be more suds the last week."

C. The failure by the Commission's experts to follow the manufacturer's instructions in their installations of the Evis unit.

The Evis Manufacturing Company commenced business in 1952. At that time the Evis unit, in the limited areas in which it had been installed, had operated successfully without grounding against electrical currents.

"* * * we were under the impression * * * that all you had to do was install it in the pipe line, and it would remove the scale and prevent its reformation and in many, many cases that is so, that is true. We have thousands of installations where that is actually the case * * *" (R. IV, 2922).

Accordingly, the manufacturer's first instructions merely provided for fitting the unit into the main water supply line (CX 2, R. VI, 818). As numerous installa-

tions were made in different areas, however, difficulties appeared.

“* * * so the field operators, the men in the field, began investigating these installations and trying to determine what the phenomenon might be that was causing it not to work * * *” (R. IV, 2923).

These investigations disclosed that electrical disturbances in the pipe lines were causing the trouble and that the installation of shunting and grounding wires was necessary to make the unit function (R. IV, 2923-2928, 3146-3147, 3154-3155, 3159-3162). The influence of electrical currents upon the behavior of water, of course, is well known to science, though little understood,⁴² and it is also known that the effect of these currents varies from place to place, depending upon the physical environment⁴³ and the installations.⁴⁴

As the engineers and representatives of Evis Manufacturing Company pooled their knowledge and experience concerning the effect of electrical currents on the Evis unit, the manufacturer amended its instructions to reflect

⁴²See the next section of this brief, *infra*, pp. 47 to 56.

⁴³Thus, in the little town of Bellville, New Jersey, where “you take a shovel and dig down two feet and there was water; everything was perfectly grounded like a ship at sea” (R. IV, 2925), the Evis unit functioned successfully in every installation without grounding. Five miles away it was impossible to make an Evis unit function (R. IV, 2925).

See, also, *supra*, pp. 6 to 7, showing the extraordinary success of Evis installations on ships where all equipment is perfectly grounded (R. IV, 2469).

⁴⁴See *infra*, pp. 50 to 51, giving an instance where the cathodic method of water treatment protected 30 miles of pipe line with the use of half an ampere, whereas on another pipe line with faulty connections 1200 amperes were required to protect 50 miles of line.

these discoveries. The Installation and Service Bulletin issued by petitioners six months before the institution of these proceedings (RX 34; R. VI, 1009-1012) was prepared at a meeting of approximately 30 representatives of the Company from all parts of the United States, who "pooled all of their knowledge of Evis installation techniques and * * * put it all into that bulletin" (R. IV, 2931). This bulletin was in the hands of the Commission long before these proceedings were brought, as was also another bulletin issued at about the same time (CX 31, R. VI, 896-900) bearing a stamp showing its receipt by the Bureau of Investigation of the Commission five months before the complaint was filed. These instructions emphasized the necessity for grounding and described in detail how it should be done. They also contained specific instructions for the conducting of laboratory tests. The instructions were simple, reasonable and readily performable by anyone seeking to test the unit. Among the latter instructions were (Id., 898, 899):

1. Treated and untreated water should not be mixed.
2. There should be no cross-connection piping.
3. In boiler tests means for blow-down should be provided.⁴⁵

Not one of the Commission's expert witnesses (with the exception of Dr. Allison, *supra*, pp. 36 to 38) complied with these instructions. Over and over the Hearing Examiner, who heard the witnesses, noted:

⁴⁵See pp. 66-70, *infra*, for a description of blow-down.

“A number of the manufacturers’ instructions relative to the installation of the Evis Water Conditioner were not followed * * *” (R. I, 708).

“This test contravened the manufacturers’ instruction * * *” (R. I, 714).

“Respondents’ directions for the installation of the Evis Water Conditioner were ignored * * *” (R. I, 715).

“A number of the manufacturers’ instructions relative to the installation of the Evis Water Conditioner were not observed” (R. I, 716).

“* * * the manufacturers’ instructions for the installation of the Evis unit were not complied with in a number of particulars * * *” (R. I, 716).

“Since it appears that the Evis Water Conditioner used in this test may not have been installed in accordance with the manufacturers’ instructions therefor, it must be concluded that the test is not decisive and cannot serve as a sound basis for a conclusion that the Evis Water Conditioner will not prevent or remove scale in pipes” (R. I, 717).

“Concerning the instructions of the manufacturers for installing the Evis Water Conditioner, [the witness] testified:

“* * * We didn’t pay any attention to such instructions,’

and that he made no effort to determine whether the unit was ‘properly installed’ ” (R. I, 717-718).

“The evidence shows that this procedure [petitioners’ instructions for blowdown] * * * was not taken into consideration in the tests * * *” (R. I, 721).

Specifically, the omissions were as follows:

Merrell and Carty: No grounding; cross-connection piping (R. II, 29, 77-81).

Mallory and Wakeman: No grounding (on the contrary the heat for this experiment was supplied by electric wires wrapped around the piping!); cross-connection piping (CX 5A; R. VI, 826; CX 5B; R. VI, 825).

Kleiner and Corfield: No grounding; cross-connection piping (R. II, 337-341).

de Bussieres: No grounding; cross-connection piping (R. II, 491-493).

Benezra: Improper grounding; cross-connection piping; mixed treated and untreated water (CX 35, R. VI, 906; R. II, 576).

Albrook, Adams, Wagner and Flay:

The laboratory installation: No grounding; cross-connection piping (CX 36, R. VI, 908).

The dishwasher installation: No grounding; cross-connection piping, including a by-pass (CX 37, R. VI, 911); unit installed on hot water line (R. II, 542, 604).

The hot water tank at Caravan Inn: No grounding; cross-connection piping, including a by-pass (CX 38, R. VI, 914).

The coffee urns on Washington State campus: No grounding (R. II, 509-510).

Weast: Improper grounding; cross-connection piping (CX 50, R. VI, 944).

Hoffman: Improper grounding; cross-connection piping (R. III, 1121, 1122, 1132, 1259).

Johnson and Gildea: Cross-connection piping (R. V, 3887, 3891); no provision for "blow-down" (CX 8, R. VI, 837; CX 31, R. VI, 899; CX 34, R. VI, 1012; CX 58, R. VI, 1024).

Hereafter in our argument (pp. 74-78, *infra*) we discuss the Commission's attempted justification of the failure of these experts to follow the manufacturers' instructions in performing their tests.

D. Theory of water treatment.

Mr. Wells does not know why his unit affects water as it does (R. II, 416). He testified that the results had been obtained empirically after long experimentation (R. II, 416). He further testified that his unit is specially processed to affect the crystals in the metal and contains inclusions not ordinarily found in cast iron and bronze (R. II, 425). But he refused to reveal the process by which this is accomplished (R. II, 426). He has applied for a patent on this process, which required, of course, a full disclosure to the Patent Office (R. II, 413-414). On the advice of counsel, however, he refused to make a public disclosure to the Commission, which would have immediately lost to him all of the value of his invention unless and until a patent issues (R. II, 426).

While the record does not disclose why the Evis unit works—since this is unknown—it does disclose significant parallels in water treatment which give full credence to the inventor's claims and wholly discredit the Commission's arbitrary and unsupported order.

Petitioners' witness O'Connell, one of the nation's most distinguished experts and consultants in the field of water

uses and control (R. IV, 2956-2960), generally discussed the problems in that field. He pointed out that through the years not one form of water treatment has "originated in the laboratory" (R. IV, 2992). Each has developed from experimentation in actual operations. He emphasized that the efficacy of water treatments cannot be determined in a laboratory. He illustrated from his own experience (in collaboration with other distinguished workers in the field) that efforts to test water treatments in the laboratory were unsatisfactory because "they were totally unable to duplicate the conditions * * *. [The] experimental approach was not conclusive because we did not succeed in using the same water velocity and the same operating conditions in the tubes" (R. IV, 2991). Among the reasons for laboratory inadequacy is (R. IV, 2992):

"The concentrations of the material which we were dealing with are so small, and in the case of the treatment of surface waters so relatively variable that it is almost impossible to duplicate in a laboratory field conditions."

In addition, Mr. O'Connell pointed out that virtually every treatment for water has been greeted with skepticism, and that many when introduced have been considered worthless and scientifically "impossible" under the knowledge of the day.

As an example, Mr. O'Connell discussed (R. IV, 2997 et seq.) the cathodic method of water treatment which was first suggested by Sir Humphry Davy in 1824 who believed that the hulls of vessels could be protected from corrosion by affixing pieces of zinc to their copper sheathing. The Encyclopaedia Britannica still records the rejection of this

device by the Lords of the Admiralty.⁴⁶ And yet today this method of protection, still only partially understood, is widely used. The method consists essentially of adding to the metal already present in the water system, another metal high on the galvanic series, such as zinc or—now more commonly—magnesium. Corrosion is the result of electrical action between two metals of different potentials (R. III, 1010, 1021). Such differences may exist within a single casting (R. III, 1010, 1011). The cathodic treatment consists of placing an anode of a chemically more active metal (the zinc plates of Sir Humphry) within the water system, so that electrolysis is reversed and, instead of corrosion occurring on the permanent surfaces of the system, the anode itself—appropriately known as the “sacrificial anode”—is gradually disintegrated by the electrical action within the water. When it was suggested, even in recent times, that the mere attaching of pieces of zinc to the stern post of vessels would prevent the hull from corroding, those who advocated this treatment “were certainly held in bad repute * * * by most of the people working in the field” (R. IV, 2997). And yet today this method protects metal from the corrosive effects of water from the family water heater to the locks of the Panama Canal.⁴⁷

⁴⁶Enc.Brit., Vol. 7, p. 89.

⁴⁷A recent article in *Business Week* tells part of this story, which is now in the realm of public knowledge:

“Tremendous advances have been made in controlling corrosion and its stupendous cost in recent years. Researchers, seeking better ways to protect metal surfaces, have unearthed properties and habits of ferrous metals that would have been

Cathodic protection may also be achieved by introducing into the water system weak outside currents which have the effect of retarding the natural corrosive action produced by the electrolysis constantly occurring within the system. Experiments have shown that widely differing results are obtained in different physical environments. As Mr. O'Connell pointed out (R. IV, 2999-3000):

“In the case of pipe lines the situation is even more extreme than that. There is one pipe line in California where about 30 miles of pipe line appear to be quite adequately protected with the use of a half an ampere at 10 volts. There is another pipe line of

beyond the wildest dreams of the corrosion engineer 25 years ago.

But the annual loss to corrosion is still staggering, despite the advances. * * *

* * * The toll of corrosion is especially alarming in the light of the rate with which the U.S. is using up its reserves of base metals * * * Nobody worries more than the scientists who are trying to find the root causes of corrosion * * * But the basic factors remain elusive—as they are in so many common phenomena. The whys of corrosion won't be found until much more is learned about matter—the interaction of atoms and molecules, the roles of electricity and magnetism.

* * * * *

Best known of all types of corrosion are the ordinary rusting of iron in the presence of water and oxygen, and galvanic—or electrochemical—corrosion, which takes place when two metals come in contact with each other in the same water or chemical solution. Here, an electric current is set up that causes the rapid corrosion of the more chemically active of the two metals.

Physicists can demonstrate that the more chemically active metal becomes an anode, the less active a cathode, with the two setting up the electrochemical process that causes the corrosion. What they can't understand is why some metals, such as silver, are relatively inactive chemically, while others, such as magnesium, are relatively active.

There are other situations that shape up as causes of corrosion too, which serve to complicate any theories concerning it. Take the so-called concentration cell corrosion, which occurs when a metal comes in contact with two different

about 50 miles in length where they are presently using twelve 100 ampere generators to produce—well, it would be 1200 amperes at about 25 volts and the protection is by far not satisfactory due to the inadequacies of the original pipe installation.”

Another form of the treatment of water with metal is as ancient as our legends. The Bible and the early Egyptian writings record the purification of water by storing it in silver and copper vessels.⁴⁸ It was not until 1915, that any theory attempting to explain this phenomenon was advanced. It is still not understood and

liquids. Researchers are not convinced that this is just another type of galvanic corrosion; they won't accept that obvious explanation until they know just what is going on in both the liquids and the metals at a molecular, atomic, and sub-atomic level.

* * * It is in the practical coping with corrosion that researchers are making their best progress, rather than in dissecting the theory of its ravages. * * *

Another big, practical help for industry is the sacrificial anode, used to protect everything from the family hot water heater to the hulls of ships and the locks of the Panama Canal. Sacrificial anodes are usually made of magnesium, a metal that is high on the galvanic series, and so serve to protect less chemically active metals like iron and steel from the damage of electrochemical corrosion. The anodes suffer the damage themselves, and can be replaced when deterioration has reached a point when they can no longer protect the other metal.

* * * * *

For decades, engineers have been working to precondition boiler water, the ideal target being water that is only slightly alkaline, and contains no dissolved solids or free oxygen. To control acidity, they have resorted to chemicals. * * *

* * * * *

* * * all these anti-corrosion measures have been leaning on the empirical—to observed knowledge of what corrosion does rather than the abstraction of why it does it * * *” (Business Week, Nov. 10, 1956, pp. 136, 138).

⁴⁸From this practice, incidentally, springs the amiable custom of the gift of a silver cup by godfathers (R. IV, 2995).

is presently being explored extensively at the California Institute of Technology (R. IV, 2995).

That the behavior of water may be affected physically by metal, as well as chemically by chemical treatment, was recognized by Commission witness Weast (R. III, 1047-1048):

“Is it also possible, in your opinion, Doctor, * * * that * * * there may be ways of preventing that corrosion from taking place, * * * by the addition of a third material of some type * * * ?

A. This type of corrosion is controlled by the addition of chemicals which will tie up those ions which might be deposited on the iron to form galvanic cells on the iron.

Q. Now, you are thinking there of the type of chemical treatment of water, as for example, where certain chemicals, phosphates or something of that kind, are actually put into the water in solution in the water?

A. Yes.

Q. Now, turning from that type of treatment, do you know, or do you have any opinion as to whether or not the same type of treatment might be brought about through the use of a metal that would simply, at some point in this water system of ours, be brought into contact with the water, so that you now had, instead of two metals in the water, you had three?

A. Yes * * * This is a possibility.”

And the same witness, in commenting on the cathodic method of water treatment, was asked whether it was not true that in the earlier stages of the cathodic method of water treatment there were many “disbelievers” who

thought that it simply could not work, he agreed, but added (R. III, 1050):

“A. Certainly, but may I reiterate. I think that if an individual of the early period of the cathodic protection has started out to attempt to make cathodic protection work, it would have worked for him.”

This, of course, is the exact parallel of the situation here presented.

The record in this case discloses another exceptional development in the field of water treatment which was discovered accidentally in field practice and has no explanation under the principles of known science:

Some years ago Shell Chemical Company introduced on the Pacific Coast the fertilization of crops by supplying anhydrous ammonia in irrigation water. Immediately problems arose because of the deposit of scale on the tubes in the irrigation ditches. Dr. Rosenstein, chief chemist of Shell Chemical Company, being familiar with the chemical treatment of water, prepared a chemical which was sold as “Rose Stone.” This chemical reacted with the anhydrous ammonia and prevented the formation of scale. The farmers were directed to use it in amounts that were known to be correct according to stoichiometric reactions. (This is a chemist’s way of saying 2 plus 2 equals 4, R. IV, 3003). “Rose Stone” was expensive. Farmers began to “fudge” and cut back on the amounts used. Finally they were using one-tenth or less of the amounts theoretically necessary to produce nonscaling. And yet there was no change in the results (R. IV, 3001-3003). Thus, by accident, it was discovered that in cold

water systems the deposition of calcium and magnesium can be controlled by an amount of hexametaphosphate that cannot possibly be in complete reaction with the calcium and magnesium (R. IV, 3003). A theory to explain this phenomenon has not yet been found (R. 3003). The quantities of "neutralizing" chemical introduced into the water are so minute that they do not change anything that a normal chemical analysis of the water would disclose. Yet, in some way, deposition of the calcium and magnesium is prevented (R. IV, 3040) "* * * the physical state in which the calcium and magnesium are present [is changed] by a mechanism of which we have no further knowledge than we do of the true mechanism of the ion exchange" (R. IV, 3049). That the treatment does not "follow" the laws of chemistry was noted by Commission witness Weast (R. III, 1053):

"A. Well, this is in the threshold treatment of water with hexametaphosphate, where the stoichiometric amount of hexametaphosphate required to prevent the precipitation of calcium carbonate does not follow the laws of chemistry which involve prime valence forces."

Another type of water treatment which developed from practical use, was ridiculed by scientists, and which preceded any theoretical explanation, was the custom of the old Scotch marine engineers to throw "sugar or starch or tannin into their boilers and they didn't particularly know why except they had less trouble" (R. IV, 2994). When in the early 1920's the chemists discovered that boiler water problems were aided by chemical reactions, and the phosphate and hot line soda treatments developed, the chem-

ists "were extremely critical of the Scotch marine engineers who threw cactus juice, for example, and tannin and all these things into their boilers" (R. IV, 2994). It was not until 1935 that science began to appreciate that scaling in boilers could be lessened not only by a chemical change in the water but by a dispersing of the solids into a minutely smaller or "colloidal" form, and that the Scotch engineers by accident had discovered certain materials which did not produce the conventional chemical reaction but did have a colloidal effect upon the water (R. IV, 2994-2995).

A further recent development in water treatment is the use of ion-exchange material (R. IV, 2986-2988, 2989), another process discovered from practical experimentation and not in the laboratory. It was observed that as water came off certain soils it had a substantially different mineral character. This led to the discovery of the so-called green sands found in these soils. These sands, now used in the ion-exchange treatment have the property of absorbing certain ions in water. Without any reaction, the ions in the water are "simply held on the surface [of the sands] by a mechanism that is not yet thoroughly understood and then they can be displaced from that material by a process of reversing the chemical system" (R. IV, 2986). The water to be treated flows over the green sands until they have been covered by the attracted ions. At this point they lose their effectiveness and are "regenerated" by "washing" their surface with a "reversing process." The treatment is "probably a physical process more than a chemical process" (R. IV, 2986) and "The mechanism by which the exchange takes place is not established to the

general agreement of all of the people working in the field” (R. IV, 2987).

It was a careful consideration of all of this testimony, as well as of all the other evidence in this case, which led the Hearing Examiner to approach his decision with mature restraint (R. I, 731-732):

“It appears, on the one hand, that we may be here concerned with a worthless gadget, while, on the other, we may be here confronted with the first practical application of a device operating upon a principle heretofore unrecognized by present-day science. In the presence of such a possibility, justice to the Respondents as well as to the public interest requires that we approach with caution the issuance of a cease-and-desist order which might well mean the economic destruction of the Respondents and the consequent loss of their device.”

E. The decisions below.

1. The decisions of the Hearing Examiner.

Over the course of four years the Hearing Examiner took testimony in this case. He heard the witnesses. He appraised the exhibits as each was introduced, explained and tested on cross-examination. He became versed in the technical aspects of the case, which at times were highly complex. As no other person possibly could, he judged the credibility of the witnesses and weighed the evidence. In his final decision (R. I, 692-732) he reviewed each charge of the complaint and meticulously analyzed the testimony with respect to each. He concluded (R. I, 730-731):

“Counsel supporting the complaint criticizes all the user testimony presented by Respondents, on the theory that user witnesses are not qualified to determine the value or lack of value of the Evis Water Conditioner. Although the formally-educated witnesses possess a background of knowledge in their fields of specialty, and are trained to observe and to cross-examine their observations with greater skill than others not so trained, we believe that any intelligent person with an open and honest mind, who is capable of faithful observance of details, might successfully and fairly test the operation of the Evis Water Conditioner. Furthermore, it may be true that the practical engineer, uninfluenced by preconceived scientific theory, might more readily observe an unorthodox and unprecedented phenomenon which the formally-trained scientist might tend to reject categorically. The testimony of a number of the witnesses holding Doctor of Philosophy degrees illustrates, in this record, such a tendency. Be that, however, as it may, the witnesses for the Respondents were not all scientifically untrained. They varied from college graduates holding engineering degrees from accredited schools to persons possessing only a minimum of formal education. As a group, however, they created the impression that they were testifying to honest convictions.

* * * * *

* * * Considered in its entirety, the evidence presented on behalf of the Respondents is, to say the least, impressive.”

2. The decision of the Commission.

In contrast to the decisions of the Hearing Examiner, the decision of the Commission distorts and ridicules the claims of petitioners; accepts, with superficial, erroneous

and uncritical analyses, the testimony of every expert who testified for the Commission, although either the experts or their tests were thoroughly discredited at the trial; dismisses, with an amazing misstatement of the record, the failure of the Commission's experts to install and operate the Evis unit in accordance with the manufacturer's instructions; and summarily dismisses the testimony of petitioners' witnesses as that of "a number of users" who "believed" that they obtained beneficial results from the use of the Evis unit (R. I, 816).

SPECIFICATIONS OF ERROR

The Commission erred:

1. In finding that the record contains reliable, probative and substantial evidence supporting the allegations of the complaint, for the reason that said finding is without support in the record. The only reliable, probative and substantial evidence disproves the allegations of the complaint and establishes the merit of the Evis Water Conditioner.

2. In finding that the Evis Water Conditioner will not perform as represented by petitioners, for the reason that said finding is not supported by the evidence.

3. In finding that petitioners' statements and representations, as alleged in the complaint or otherwise, are false, misleading or deceptive, for the reason that said finding is not supported by the evidence.

4. In finding, in the absence of any evidence, that the use by petitioners of the statements and representations,

alleged in the complaint or otherwise, has had the tendency or capacity to mislead a substantial or any portion of the purchasing public because of an erroneous and mistaken belief as to the truth of such statements and representations.

5. In finding, in the absence of any evidence, that as a result of the use by petitioners of the statements and representations, alleged in the complaint or otherwise, injury has been done to competition in commerce among and between the various states of the United States and in the District of Columbia.

6. In concluding, in the absence of any justification in the record, that all or any of the acts and practices of petitioners, as found by the Commission or otherwise, have been to the prejudice and injury of the public or of the competitors of petitioners, or have constituted unfair methods of competition or unfair or deceptive acts and practices in commerce within the intent and meaning of the Federal Trade Commission Act.

7. In finding that petitioners have represented, either directly or by implication, that in its use and operation the Evis Water Conditioner will cause water to become "soft" or "softer" as these terms are commonly used to connote the removal or conversion of natural minerals in water. The record shows that for a considerable period of time prior to the filing of the complaint, petitioners' advertising media consistently stated that the product is not a water softener and that it neither adds nor eliminates natural minerals in the water.

8. In including in its order items of performance taken from paragraph 6 of the complaint with respect to which

no evidence of any kind was offered as to the performance of the Evis unit.

9. In disregarding and dismissing the uncontradicted testimony of 92 witnesses offered by petitioners, who were with few exceptions licensed or experienced professional operating engineers, who testified to the merit, value and utility of the Evis Water Conditioner when used in practical installations under the conditions and for the purposes for which it was designed and sold.

10. In ruling that the uncontradicted testimony of actual users of the product was of little or no probative value in this case and in holding that the only evidence entitled to be given weight was the "scientific" opinions of the Commission witnesses.

11. In dismissing as "of little, if any, significance," the scientific testimony presented by petitioners.

12. In drawing a sharp distinction between its own witnesses, whom it self-servingly calls "experts," and petitioners' witnesses, referred to by the Commission as "users"; examination of the record clearly demonstrates that the petitioners' witnesses are the real experts in this proceeding and that their testimony is of great significance.

13. In attributing probative value to the testimony of Commission witnesses notwithstanding that they failed to test the product for the purposes for which it was sold and/or failed to test it under the conditions for which it was intended to be used.

14. In attributing probative value to purported tests of the Evis Water Conditioner conducted by Commission

witnesses, notwithstanding the fact that such witnesses ignored, failed to comply with, or refused to follow, the instructions of petitioners for the proper installation and use of the product.

15. In attributing probative value to tests conducted by Commission witnesses to determine whether the Evis Water Conditioner effects a chemical change in water, notwithstanding the undisputed fact that petitioners make no such representation for the product and that their advertising literature and instructions for the use of the product specifically disclaim such a change, and further in attributing any probative weight to such witnesses' opinions based upon such tests.

16. In giving weight and credence to the opinion testimony of Commission witnesses on the basis of their education, training and general experience and in disregard of the absence of any foundation for such opinions based upon tests or experience with the product under the operating conditions for which it was sold.

17. In holding that, on the issue of the merit and utility of the product, contrived laboratory experiments conducted without regard to the purposes for which the product was sold, the normal operating conditions under which it is used, and in violation of the manufacturer's instructions for installation and use of the product, were controlling; whereas undisputed evidence of the successful use of the product and utility in practical installations was to be disregarded.

18. In drawing conclusions from the opinions of Commission witnesses which conclusions such witnesses themselves specifically refused to draw.

19. In disregarding admissions of the Commission witnesses:

(a) That they would not discount or deny the value or utility of a product merely because they did not know or understand its scientific principle;

(b) That their own tests were not designed nor intended to determine the value or utility of the product when used in practical installations under normal operating conditions;

(c) That they disregarded, ignored or refused to follow the petitioners' instructions for the installation and use of the product and in some instances purposefully violated such instructions; and/or

(d) That they performed tests for uses and/or effects of the product not claimed and in fact disclaimed by petitioners, but nevertheless based their opinions upon such tests.

20. In holding that petitioners' refusal to make a public disclosure of their secret process was to be construed as confirmation of the allegations of the complaint.

21. In construing the record as though it contained the evidence of 3,000 unsuccessful performances of the Evis Water Conditioner.

22. In adopting and applying to this proceeding an erroneous principle, namely, that if scientists called as Commission witnesses are unable to offer any scientific theory or explanation for the operation of a newly discovered product, such inability establishes the lack of utility of the product and is controlling in the face of undisputed and overwhelming evidence of its successful

use in practical installations under normal operating conditions.

23. In holding as a matter of law that user testimony has little or no probative value and therefore may be disregarded unless "there is scientific evidence of considerable weight on both sides of the question."

24. In failing to give due weight to the two Initial Decisions of the Hearing Examiner, who heard and saw the witnesses and who had the better opportunity to evaluate the testimony and the issues of the case; the Commission erred in vacating the first and second Initial Decisions of the Hearing Examiner by reason of the fact that said Initial Decisions are supported by and were in accordance with both the evidence and the law.

ARGUMENT.

A. THE COMMISSION ERRED IN GIVING CONCLUSIVE EFFECT TO THE TESTIMONY OF THE COMMISSION'S EXPERTS, IN GIVING NO EFFECT TO THE UNCONTRADICTED TESTIMONY OF THE SUCCESSFUL PERFORMANCE OF THE EVIS UNIT IN ACTUAL OPERATION, AND IN HOLDING THAT RELIABLE, SUBSTANTIAL AND PROBATIVE EVIDENCE SUPPORTS THE CHARGES THAT THE EVIS WATER CONDITIONER WILL NOT PERFORM AS CLAIMED.

Earlier in this brief we have reviewed the testimony of petitioners' witnesses, most of them experts in the field of water uses. Trained, intelligent, credible men, they testified to physical facts, objectively observable. On the issue of scale, for example, their testimony establishes as a plain, indisputable, physical fact that the Evis unit actually does remove and prevent scale when used in the practical operations for which it is intended and for which

it is sold. This physical fact is not changed by the testimony of Mr. Merrell who trickled water in a laboratory through an eight inch length of pipe (supra, p. 38), the testimony of Dr. Hoffman, who trickled water in a laboratory through a two and one half inch length of pipe (supra, p. 40), or the testimony of Dr. Weast who experimented with high oxygen content water on pipe largely encrusted with rust (supra, p. 38). By the same token, the testimony of these witnesses is not, we submit, substantial evidence that the Evis unit cannot and does not remove scale.

The Commission ignores the testimony of the many witnesses who saw and used the Evis unit. In a few lines (R. I, 815-816) it brushes it aside as that of "a number of users" who "believed" that they obtained beneficial results but who did not make their observations "under scientifically controlled conditions." It turns to the opinions of the experts and finds in them substantial evidence that that which did occur could not occur. To the Commission the fact that Dr. Wagner finds from his infrared spectro-analyses that the Evis unit produces no "alteration in the molecular structure, the geometric configuration of the molecules" in water (R. I, 813), the fact that Mr. de Bussieres, "a chemical engineer of long experience" who was interested in the "'dielectric constant,' a measure of the internal molecular structure of a substance," found that the water had not changed in certain characteristics which "might change if the dielectric constant changed" (R. I, 810),⁴⁸ conclusively establishes that

⁴⁸The Commission does not point out, in appraising the relevance of these tests, that Mr. de Bussieres testified that changes

Mr. Durst, a graduate engineer with years of experience in water-using operations, did not see scale actually removed by the Evis unit in the equipment on his drilling rigs (supra, pp. 17-18). By the same reasoning, to use Mr. Durst's whimsical simile, the Commission should hold that a humblebee is earthbound, because "aerodynamically he can't fly" (supra, p. 18).⁴⁹

Without discrimination, without analysis, the decision of the Commission names one after another the so-called experts called by the Commission, lists their titles, quotes their opinions and accords those opinions conclusive weight. For example, Dr. Albrook and Dr. Adams become "Director of Industrial Research, Washington State College," and "a research chemist of the same institution" who conducted tests which "failed to show that the Evis water conditioner was of any value." No mention is made of the more than two hundred pages of cross-examination which literally destroyed the credibility of these witnesses and led the Hearing Examiner to make findings as severe, perhaps, as could be directed against men of their profession, finding their testimony "evasive" and unworthy of belief (R. I, 718-719).

Heretofore in this brief we have discussed all of the Commission's experts. We wish to elaborate upon just

in the molecular structure of substances are currently being brought about "by exposure to cyclotrons, etc., and atomic rearrangements" (R. II, 490); that a rearrangement in the molecular structure of water "could not be made without subjecting it to some tremendous forces" (R. II, 491).

⁴⁹Actually such a holding would be no more startling than the Commission's statement in its opinion that the turbulent water in a washing machine is not to be considered in a dynamic state because it is "static in the sense that it is not moving through a pipe" (R. I, 813).

one instance because of the exceptional importance of the issue of prevention and removal of scale in this case.

In its opinion the Commission says (R. I, 811) :

“* * * extensive testing of the Evis Water Conditioner was undertaken by the Engineering Experiment Station of the University of Virginia. Dr. Lewis B. Johnson, Jr., and Dr. Robert Gildea, who worked on and were responsible for these experiments, both testified, in substance, that the Evis unit will not alter the characteristics of water and that it will not produce the beneficial effects claimed for it. The evidence so adduced clearly confirms the scientific showing made prior to the remand.”

As a matter of fact the “evidence so adduced” does not clearly or at all confirm any charge of the complaint.

These experts were requested by the Commission to determine whether the Evis unit would prevent and remove scale. To appraise their tests a few practical facts may be recalled.

A boiler or evaporator is, of course, a device in which water is converted by heat into steam. As the steam is drawn off the water supply is continuously replenished. The steam removes none of the solids and, as their concentration in the boiler water increases, they precipitate on the hot walls. To prevent or minimize this precipitation the solids are removed by “blow-downs,” which consist simply of draining off all or a portion of the water from time to time. Continuous blow-downs, usually every few hours,⁵⁰ are essential.

⁵⁰Evaporators and boilers are blown down every three hours (Samuel R. Morris, Chief Engineer, Transoceanic Marine Corpo-

The function of a water conditioner is not to make solids disappear—a physical impossibility. Its function is to keep the solids in such a state that they do not adhere to the boiler or evaporator walls and will be removed by the blow-downs.

Let us turn now to the “tests” which Drs. Johnson and Gildea devised to determine whether the Evis unit will prevent or remove scale.

Dr. Johnson took five one-gallon laboratory stills, capable of evaporating one gallon per hour, and operated them as follows: The stills were each filled with well water from the nearby Blandy Farm, a hard water containing 200 parts per million of dissolved solids (CX 64, R. VI, 1006). Each still had a continuous feed of water so that as the steam boiled off, the water in the still remained at a constant level. The water feed was so arranged that water from the still, with its accumulating solids, could not escape (R. V, 3798, 3842, 3843, 3845, 3859, 3880, 3881). Four stills were fed with Evis treated water; one with untreated water. The heat was turned on the stills and they were left to boil continuously, from week to week, for ten weeks. Each week Dr. Johnson

ration, marine evaporators, R. IV, 2644-2647) or every four hours (Alexander MacKenzie, Chief Engineer, United Fruit Company, marine evaporators, R. IV, 3175; Denzel R. Carpenter, Chief Engineer, United Fruit Company, marine evaporators, RX 56, R. VI, 1077), or every eight hours (Ellis J. Shane, Engineer, American Rock Wool Corporation, Tacoma, Washington, boiler, R. IV, 3086), or every twelve hours (George D. Bowersock, Chief Engineer, Pope & Talbot, Inc., marine evaporators, RX 58, R. VI, 1142), or, with treated water, sometimes only every twenty-four hours (Lawrence L. Sligh, Chief Engineer, Bridgford Packing Company, boilers, R. III, 1922-1923).

disconnected the stills, emptied the water, rinsed out the stills, air dried the solids that had adhered to the walls, and weighed the stills. The stills were then reconnected and the same procedure followed during the next week. At the end of the experiment Dr. Johnson found that solids had accumulated in all five stills at approximately the same rate (CX 64, R. VI, 987-988). During each full week of the entire ten weeks of the experiment the drain cocks or "blow-down valves" of the stills were never opened. This procedure is to be compared with that followed in operating an industrial marine evaporator:

"[Q.] * * * please state how often the evaporator was blown down in normal operations, and describe in detail the method used.

A. Well, that was blown down about every four hours. And the method used is a—build up a steam pressure and open the bottom blow valve, the blow down valve until it was blown out. Then we would fill it up again with fresh water" (testimony of Denzel R. Carpenter, Chief Engineer, United Fruit Company, RX 56, R. VI, 1077-1078).

A simple calculation shows that, at the end of the first week, Dr. Johnson's stills contained, in dissolved or undissolved form, concentrations of 33,600 parts per million of solids.⁵¹ Each week, the same amount of solids was added. Each week—except for the minute amount suspended in the one gallon of water drained out—these solids simply accumulated on the walls of the stills. The

⁵¹One gallon per hour, times 24 hours, times seven days, times 200 parts per million of solids in the Blandy Farm water ($1 \times 24 \times 7 \times 200 = 33,600$).

“test” was the same as though a housewife had boiled a one-gallon teakettle dry every hour for 10 weeks and then weighed the accumulated solids.

Further, the concentration of silica built up in the stills far exceeded the limits prescribed by petitioners for the effectiveness of the Evis unit, i.e., 60 parts per million (CX 31, R. VI, 897). Dr. Johnson’s analysis (CX 64, R. VI, 1006) of Blandy Farm water showed that it contained 10.7 parts per million of silica. Thus each week he put into each still 1797.6 parts of silica.

And further, the solids on the walls of the stills were not scale at all. The Hearing Examiner described them as “soft chalky material” which “gives way on pressure of my fingernail” (R. V, 3833).

Dr. Johnson’s test for “removal of scale” was even more extraordinary. Here again he used a one-gallon per hour still, but this time one that was “badly scaled.” He boiled this still continuously for two-week periods, with no blow-down for ten weeks (R. V, 3795). Thus the still accumulated, each two weeks, a concentration of 67,-200 parts of solids, including 3,600 parts of silica (CX 64, R. VI, 1006). The concentration of silica alone, during each two-week period, was 60 times higher than the maximum permissible limit set in petitioners’ instructions (CX 31, R. VI, 897). At the end of each two-week period Dr. Johnson weighed the still, and found it heavier.

Counsel for the Commission had recognized the requirements for blow-down in his instructions to these witnesses. Dr. Johnson’s workbook (RX 59, R. VI, 1162; 2-11/6168-1,

pp. 61-63) outlines the procedures prescribed for him. One was:

“4. Blow-down will be carried out on each still.”

Dr. Johnson's superior, Mr. Gildea, testified that he did not know why the blow-down requirement was not carried out (R. V, 3981-3982). Dr. Johnson knew nothing about the operation of a boiler (R. V, 3853, 3876). Neither Dr. Johnson nor Mr. Gildea had any knowledge of the permissible maximum concentrations prescribed by the American Boiler Manufacturers Association (R. V, 3860, 3976). Neither had any knowledge of the maximum concentrations which can be allowed to accumulate in the normal operation of a low pressure boiler or evaporator (R. V, 3860, 3976). Dr. Johnson knew nothing about the means of computing a blow-down percentage necessary to control concentrations based upon total solids or the type of solids in the water being used (R. V, 3854). He finally said (R. V, 3870) “I don't know what blow-down means.” The Hearing Examiner added (R. V, 3876):

“Let's depart from boilers since he said he doesn't know anything about them.”

These are the tests which the Commission finds “clearly [confirm] the scientific showing” (R. I, 811) that the Evis unit will not remove or prevent scale.

The basic error of the Commission, of course, is that it is seeking to apply to this case the principle that “user testimonials” in the patent medicine field do not furnish substantial evidence as against credible expert opinion. These cases recently have been examined by this Court (*Carter Products, Inc. v. Federal Trade Commission* (9

Cir. 1959) 268 F.2d 461). But the witnesses in this case are not women who, Eve-like, see in the mirror a rejuvenation of fading skin by the cream of Charles of the Ritz,⁵² or witnesses who find virtue in patent medicines for hair and scalp,⁵³ or rheumatism,⁵⁴ or cancer, leprosy and malaria,⁵⁵ or in medical appliances.⁵⁶ In sum, they are not “ ‘that vast multitude which includes the ignorant, the unthinking and the credulous.’ ”⁵⁷ On the contrary, they are the true experts in this case.

B. THE COMMISSION ERRED IN FAILING TO GIVE DUE WEIGHT TO THE DECISIONS OF THE HEARING EXAMINER WHO HEARD AND SAW THE WITNESSES AND HAD THE BETTER OPPORTUNITY TO EVALUATE THEIR TESTIMONY. HIS DECISIONS DEMONSTRATE THE LACK OF MERIT IN THE COMMISSION'S CASE AND THIS COURT, ON REVIEW, SHOULD ACCORD TO THEM THE WEIGHT TO WHICH THEY ARE ENTITLED.

The Hearing Examiner “lived” with this case for nearly four years, heard the testimony of 124 witnesses and appraised their credibility under rigorous cross-examination. His initial decisions meticulously analyze the evidence and reflect his familiarity with each witness and his testimony. The cursory and uncritical rejection of his find-

⁵²*Charles of the Ritz Dist. Corp. v. Federal Trade Com'n* (2 Cir. 1944) 143 F.2d 676.

⁵³*United States v. 50¾ Dozen Bottles, etc.* (W.D.Mo. 1944) 54 F.Supp. 759.

⁵⁴*Rhodes Pharmacal Co., Inc. et al.* (1952) 49 F.T.C. 263, 284.

⁵⁵*Koch Laboratories, Inc. et al.* (1951) 48 F.T.C. 234, 249.

⁵⁶*The Dobbs Truss Co., Inc., et al.* (1952) 48 F.T.C. 1090, 1113 [Docket No. 5808].

⁵⁷*Charles of the Ritz Dist. Corp. v. Federal Trade Com'n* (2 Cir. 1944) 143 F.2d 676, 679.

ings and conclusions by the Commission was, we submit, erroneous and this Court should accord to them the weight that reasonably they command.

It is now settled (*Universal Camera Corp. v. Labor Bd.* (1951) 340 U.S. 474, 497) that the initial decision of the Hearing Examiner is an integral part of the record and that the reviewing court "should accord the findings of the trial examiner the relevance that they reasonably command."⁵⁸

In the *Universal Camera* case the Supreme Court held (340 U.S. at pp. 493-494, 496):

"* * * the plain language of the statutes directs a reviewing court to determine the substantiality of evidence on the record including the examiner's report. The conclusion is confirmed by the indications in the legislative history that enhancement of the status and function of the trial examiner was one of the important purposes of the movement for administrative reform.

* * * * *

* * * The findings of the examiner are to be considered along with the consistency and inherent probability of testimony."

This rule has often been applied. Thus in *Minneapolis-Honeywell Reg. Co. v. Federal Trade Com'n* (7 Cir. 1951) 191 F.2d 786, the court held (pp. 789-790):

"Under the rule of *Universal Camera Corp. v. National Labor Relations Board*, 340 U.S. 474, 496, 71 S.Ct. 456, 469, it is the duty of this court to examine

⁵⁸This principle and others affecting judicial review have recently been considered by this Court in *Carter Products, Inc. v. Federal Trade Commission* (June 19, 1959) 268 F.2d 461.

the record as a whole, including the report of the examiner, in order to determine whether the evidence supporting the Commission's order is substantial.

* * *

* * * * *

* * * And while the findings of an examiner are not 'as unassailable as a master's * * *' where it appears from the record that they are supported by a preponderance of the evidence, the action of the Commission in rejecting them is arbitrary."

And in *Ohio Associated Tel. Co. v. National Labor Relations Bd.* (6 Cir. 1951) 192 F.2d 664, the court stated (p. 668):

"In view of the fact that the examiner heard and saw the witnesses, and the Board did not, it is pertinent to inquire into the relative weight to be given by a reviewing Court to the findings of examiner and Board. * * * an examiner's findings are not to be given such finality as is accorded to the findings of a Master or District Judge sitting without a jury, and so to be accepted unless clearly erroneous * * * [But] It would seem * * * in giving consideration to the whole record, as now we are obliged to do, we may not disregard the superior advantages of the examiner who heard and saw the witnesses for determining their credibility, and so for ascertaining the truth."

To the same effect, see:

National Labor Relations Board v. Dinion Coil Co.
(2 Cir. 1952) 201 F.2d 484;

United States Steel Co. v. Rel. Bd. (7 Cir. 1952) 196
F.2d 459, 467;

Folds v. Federal Trade Commission (7 Cir. 1951)
187 F.2d 658, 660, 661.

This case emphasizes, as few others could, the essential role these principles play in the administration of justice. The Hearing Examiner sat in eleven different cities to hear and see the witnesses. The credibility of these witnesses was sharply tested by the cross-examination of both counsel for petitioners and counsel for the Commission. Only confrontation of these witnesses by the trier of the facts could disclose the bias and prejudice which rendered certain testimony unworthy of belief (*supra*, p. 27); the tendency of other "witnesses holding Doctor of Philosophy degrees" "to reject categorically" "unorthodox and unprecedented phenomena" which a "practical engineer, uninfluenced by preconceived scientific theory, might more readily observe" (*supra*, p. 57); the "impressive" character of the testimony of those who had seen and used the Evis unit in practical operations (*supra*, p. 57).

C. THE COMMISSION ERRED IN GIVING WEIGHT TO EXPERIMENTS PERFORMED BY EXPERTS WHOSE INSTALLATIONS WERE NOT MADE IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS.

We have noted above the failure of each of the Commission's expert witnesses, save one, to follow the manufacturer's instructions in installing the units with which they experimented (*supra*, pp. 44 to 47). The Commission recognized that "Manufacturers' instructions should be followed, of course, to achieve the results claimed for a product" (R. I, 811). But it held that the failure to follow instructions in this case did not affect the weight of the tests because (R. I, 811):

“[1] in this case the ‘instructions’ have varied from time to time and [2] apparently are not all contained in any one document. * * * [3] Moreover, respondents’ witnesses who * * * claimed beneficial results, admitted in many instances that no particular instructions were followed. Also, [4] respondents in their literature suggest that Evis treated water can be procured simply by running tap water through the Evis Water Conditioner, the implication being that an elaborate hookup is not essential. [5] In addition, certain of the expert witnesses * * * testified that failure to follow detailed instructions would have made no difference in the results. * * * [6] the admission of Mr. Wells * * * that he had no scientific principle to explain the claimed effect of the Evis device, places on the respondents some burden of showing the necessity for the detailed instructions, and no such showing was made.”

Here again, in marked contrast to the Hearing Examiner, the Commission reveals its total unfamiliarity with the record. Directly contrary to its statement that “no showing was made” by petitioners of the necessity for the “detailed instructions,”⁵⁹ extensive testimony was directed to each of the points referred to by the Commission (*supra*, pp. 42-44).

As we have pointed out earlier in this brief (*supra*, pp. 42-44), the changes in petitioners’ instructions added cer-

⁵⁹These “detailed instructions” were (1) directions for the appropriate grounding of the water system; a direction (2) not to mix treated and untreated water or (3) to take water from a connected set of pipes in making tests, and (4) a direction to use familiar blow-down procedures in tests for scale. It would be hard to conceive of a more understandable and reasonable set of instructions.

tain directions, notably the requirement of grounding the water system, which experience had shown improved the performance of the unit. The fact that the first instructions merely directed that the unit be fitted into the water line, and that many such installations were successful (see pp. 42 to 44, *supra*), obviously carries no implication that the later instructions for grounding were not essential to obtain any results in many cases, and to obtain maximum results in all. As we have pointed out (*supra*, pp. 42-44) it is well known that stray electrical currents affect the action of water. And certainly the importance of following the instructions after observation had shown that electrical currents adversely affected the treatment was not lessened, as the Commission suggests, by the fact that petitioners did not know why they affected it.

A further basis for the Commission's ruling that its experts could disregard the manufacturer's instructions was that the instructions "are not all contained in any one document" (R. I, 811). The instructions noted above which were disregarded were contained in two bulletins, both of which were in the hands of the Commission long prior to the filing of this complaint (*supra*, p. 44). It would seem that an expert qualified to make a scientific test of a device, and to arrive at an expert opinion concerning its performance, would be capable of looking at two pieces of paper for his directions. At all times the advice and assistance of petitioners' representatives were available (see *supra*, pp. 26 to 27).

The Commission's final ground of decision rested upon the testimony of certain of the experts who performed the experiments. They testified that their results would

have been the same whether or not they followed the instructions. This, of course, is surmise. In addition, we answer in the words of Dr. Hoffman on cross-examination (R. III, 1272-1273, 1275):

“Q. * * * Let us assume that a manufacturer comes out with some new product. Let us assume that he has developed an entirely new scientific theory on which his product is based. Let us assume that the scientific world has not yet learned of that theory and has not yet had an opportunity to study it and evaluate it. Let us assume that that product goes out in the market and is used, and let us assume, as the record in this case shows, that in practical installations, that product is 97 per cent successful. Let us assume that the product is then brought to the National Bureau of Standards for testing and evaluating, and let us assume that the manufacturer has certain explicit instructions as to how the product is to be installed and operated.

Now, when these tests are being conducted, let us assume whoever is conducting them is not familiar with the scientific theory that this inventor has developed. Do you not feel, Doctor, that under those circumstances, in all fairness to the inventor, as well as to yourself and the National Bureau of Standards, that the only reliable way to conduct a fair test would be to carry out to the letter the instructions of the manufacturer, irrespective of what your own opinions might be as to the value of the installation itself?

* * * * *

A. I think I will repeat what I said before. If the manufacturer has instructions, since he does not have the knowledge of the theory and I don't, then I be-

lieve I had better follow those instructions as nearly as possible as they are given.”

D. THE COMMISSION ERRED IN RELYING UPON WHAT IT TERMED A SHOWING THAT 3,000 INSTALLATIONS OF THE EVIS WATER CONDITIONER WERE FAILURES.

In its opinion the Commission says (R. I, 809):

“The evidence received in support of the complaint includes a showing that 3,000 installations of the Evis Water Conditioner were failures (by virtue of an admission of counsel) * * *.”

This statement, standing alone, grossly misrepresents the record. The entire proceedings in this regard are at R. V, 3726-3768, and can be read in a few moments. What actually occurred is this (R. V, 3726-3768):

The Commission's case in chief consisted entirely of the testimony of the experts to whom we have referred. It was taken over the course of several months in Los Angeles, San Francisco, Pullman, Portland, Cleveland and Washington, D.C. Thereafter petitioners put on their case, at Los Angeles, Fresno, San Francisco, Seattle, Tacoma, and Dallas. When petitioners rested, counsel for the Commission proposed to start all over again by calling user witnesses who, he said, would testify that installations had failed. Counsel for petitioners moved to exclude this evidence, protesting that it was not rebuttal evidence; that if the Commission had intended to rely on user testimony, it should have introduced it in its case in chief; that it would be an abuse of discretion by the Hearing Examiner to open the hearings to further endless testimony. He

recalled that the testimony of 124 witnesses had been taken in 11 widely distant cities over the course of two years; that the cost to petitioners had been staggering, resulting in their virtual bankruptcy; that if accepted rules of trial were not enforced the case would become moot for lack of ability further to defend it (R. V, 3749-3750, 3754). Further he pointed out that petitioners never have represented that the Evis unit works in all cases; that petitioners' own testimony showed that there had been approximately 100,000 units installed of which about 97 per cent were successful and approximately three per cent were unsuccessful. In the circumstances counsel contended that the evidence which the Commission proposed to introduce was not only inadmissible as rebuttal evidence but also would add nothing to the record (R. V, 3751-3754).

Thereupon the Hearing Examiner inquired of counsel for the Commission whether he proposed to present the testimony of more than 3,000 witnesses, which counsel for petitioners would admit would be the approximate number of failures that could be shown from among the total installations (R. V, 3757 et seq.). The following then occurred (R. V, 3764-3765, 3767-3768):

“MR. MICHAEL: I will say it as frankly and as bluntly as I can that I don't have any doubt in my mind—and as I said at the outset before—we don't claim it works in every case. We concede that 3 percent.

HEARING EXAMINER LIPSCOMB: At least 3 percent.

MR. MICHAEL: Have been unsuccessful and there have been a hundred thousand sold. If we

wanted to take all the testimony available in the country you could probably find 3,000 witnesses in the country who would say it did not work. The only reservation I make is that by the same token it is our position that if we went to every nook and cranny in the country we would get the other 97,000 and we would both be doing what the record already shows.

I can't say any more than that.

HEARING EXAMINER LIPSCOMB: One part of your statement is an admission, the other is a self-serving declaration and they would be so regarded.

MR. MICHAEL: I don't quarrel with that. I am only making the admission with that reservation. I am saying that that is what the record shows. * * *

* * * * *

MR. DOWNS: I have one remark to make with regard to the statement that Mr. Michael made. I do not want the record to indicate that I in any way endorse his statement that it is successful 97 percent of the time. I do not concede that point. He made the statement that it did not work in 3,000 cases but it did work in 97,000 cases. I do not want to have the record indicate that I agree with that at all, the 97,000.

HEARING EXAMINER LIPSCOMB: In light of the admission on the record that Mr. Michael made, it appears to the Hearing Examiner that his present problem becomes a simple one, that further testimony by the government as to unsatisfied users could not produce more unless I am shown in some peculiar particular that it would be. Therefore it should not be received. Accordingly the hearing examiner rules that the proposed testimony will not be proper rebuttal testimony in the light of what I have said and therefore will not be received."

D. THE COMMISSION ERRED IN HOLDING THAT PETITIONERS' REFUSAL TO MAKE A PUBLIC DISCLOSURE OF THEIR METHOD OF PROCESSING THE METAL IN THE EVIS UNIT SHOULD BE CONSTRUED AS STRONG CONFIRMATION OF THE CHARGES IN THE COMPLAINT.

The Commission held (R.I. 815):

“Finally, we hold that under the circumstances of this case, the respondents were not privileged to stand upon their refusal to disclose the composition of the metal in the Evis Water Conditioner and the claimed special processing thereof as trade secrets; and their failure to introduce the evidence thus within their immediate knowledge and control, if existing anywhere, relative to such factors which might explain the claimed effects of the device on water, is strong confirmation of the charges in the complaint.”

In so ruling the Commission relied upon *Charles of the Ritz Dist. Corp. v. Federal Trade Com'n* (2 Cir. 1944) 143 F.2d 676. That case involved a ‘rejuvenating’ face cream, said to contain vital organic ingredients which restored the bloom of youth. On appeal—although petitioner had refused to reveal the secret formula for its cream—it contended that the medical testimony was not substantial because the experts who testified that it could not have a rejuvenating effect did not know what the cream contained. In these circumstances the court held that petitioner was not privileged to stand upon its refusal and that its failure to produce the formula was confirmation of the Commission’s charges.

In the case at bar petitioners of course do not contend that the testimony of any of the experts is unsubstantial because he does not know the process by which the unit

is made. The question here is not how the unit is processed, but what is its affect upon water. As to this, the only knowledge Mr. Wells has is what he has observed in the behavior of the water. He has withheld none of this knowledge. The same observations Mr. Wells has made can be made by the Commission's witnesses. Nor has Mr. Wells withheld any knowledge as to why the unit is effective. His results have been achieved by experimentation (as have virtually all results in the field of water treatment, *supra*, p. 47, et seq.). Explanation awaits further knowledge. The only fact Mr. Wells has withheld is the method of processing the metal. It would, we submit, be grossly unfair and unnecessary to require him to disclose this process to the public, which would immediately lose to him all of his common law rights. He already has disclosed the process to the Patent Office. There, as the law provides, the secrecy of his disclosure is maintained until a patent issues (Rules of Practice in Patent Cases, section 1.14, 35 U.S.C.A., Supp., 653).

It is manifest, we submit, that the disclosure of petitioners process is not essential to the development of truth in this case. The demonstrated effects of the unit, not how it is made, determine the issues. The testimony of the Commission's experts in this case is not unsubstantial because they do not know the process. It is unsubstantial because the tests were either wholly irrelevant or were conducted under such artificial conditions, as compared with actual operating conditions, as to have no probative value.⁶⁰

⁶⁰*Kidder Oil Co. v. Federal Trade Commission* (7 Cir. 1941) 117 F.2d 892, 897, 898; *Navajo Freight Lines v. Mahaffy* (10 Cir.

Had the Commission wished to present reliable, probative and substantial evidence that the Evis unit would not work on marine evaporators, for example, it could—instead of having Dr. Hoffman drip water through a 2½-inch section of pipe—have arranged for one of its representatives to make parallel tests, under actual operating conditions, on shipboard. If it had wished, as another example, to prove that the unit would not function on evaporative condensers, it could—and this we emphasize—have called the employees of the United States Department of Agriculture at Beltsville, Maryland, to testify to the installation at the Experiment Station. This installation was but a few miles from the hearing room. The attention of the Commission had been called to it long before the Commission closed its case in chief (*supra*, pp. 27-30).

As authority for its ruling in the *Charles of the Ritz* case the court cited a number of well-known cases applying the principle that silence can be inferential evidence against one who has strong evidence in his possession and does not produce it. The principle of these cases is applicable, we submit, not to petitioners, but to the Commission.

1949) 174 F.2d 305, 309-310; *Hutzler Bros. Co. v. Sales Affiliates* (4 Cir. 1947) 164 F.2d 260, 265; *Donner v. Walgreen Co.* (N.D. Ill. 1930) 44 F.2d 637, 642; *International Const. Corp. v. Chapman Chemical Co.* (S.D. Fla. 1952) 103 F.Supp. 679, 682; *Johnstown Tribune Pub. Co. v. Briggs* (3 Cir. 1935) 76 F.2d 601; *Lent v. Thackaberry* (1934) 136 Cal. App. 783.

CONCLUSION.

We respectfully submit that the order of the Commission is erroneous and should be set aside.

Dated, San Francisco, California,
November 20, 1959.

Respectfully submitted,

FRANCIS R. KIRKHAM,

JAMES MICHAEL,

HARRY C. SCOTT,

PILLSBURY, MADISON & SUTRO,

Attorneys for Petitioners.

(Appendices A, B, C, D, E, F and G follow.)

Appendices.

Appendix A

List of Exhibits

(Pursuant to Rule 18.2(f))

<u>Commission's Exhibit No.</u>	<u>Identified</u>	<u>Offered</u>	<u>Received as Evidence</u>	<u>Record Identification</u>
2	II, 84	II, 85	II, 85	VI, 818, 819
3	II, 89	II, 90	II, 91	VI, 820
4	II, 138	II, 152	II, 152	VI, 823; 2-1/6168-1*
5	II, 145	II, 148, 403	II, 404	VI, 824, 825
7	II, 239	II, 239	II, 239	VI, 826
8	II, 319	II, 320	II, 321	VI, 827-838
9	II, 323	II, 324	II, 324	VI, 839, 840
10	II, 324	II, 324	II, 325	VI, 841; 2-2/6168-1*
11	II, 358	II, 359	II, 359	VI, 842, 843
12	II, 403	II, 407	II, 408	VI, 844
13	II, 403	II, 411	II, 411	VI, 845

*Record identifications marked with asterisks are to physical exhibits. The references to volume VI of the Transcript of Proceedings are to identification pages which set forth the numbers assigned to these exhibits by the Commission in certifying the record to this Court. The second numbers stated are the Commission's numbers so assigned, number 6168 being the Document number of the proceeding before the Commission.

<u>Commission's Exhibit No.</u>	<u>Identified</u>	<u>Offered</u>	<u>Received as Evidence</u>	<u>Record Identification</u>
14	II, 403	II, 411	II, 411	VI, 846
15	"	"	"	VI, 847-848
16	"	"	"	VI, 849-850
17	"	"	"	VI, 851
18	"	"	"	VI, 852-855
19	"	"	"	VI, 856-858
20	"	"	"	VI, 859, 860
21	"	"	"	VI, 861-864
22	"	"	"	VI, 865-871
23	"	"	"	VI, 872, 873
24	"	"	"	VI, 874
25	"	"	"	VI, 875
26	"	"	"	VI, 876, 877
27	"	"	"	VI, 878 - 885
28	"	"	"	VI, 886-889

<u>Commission's Exhibit No.</u>	<u>Identified</u>	<u>Offered</u>	<u>Received as Evidence</u>	<u>Record Identification</u>
29	II, 403	II, 411	II, 411	VI, 890, 891
30	"	"	"	VI, 892-895
31	"	"	"	VI, 896-900
33	"	"	"	VI, 901-904
34	II, 473	II, 473	II, 473	VI, 905
35	II, 560	II, 560	II, 560	VI, 906
36	II, 588	II, 589	II, 590	VI, 908
37	II, 601	II, 602	II, 602	VI, 911
38	II, 605	II, 605	II, 606	VI, 914
39	II, 607	II, 608	II, 611	VI, 916
40	II, 608	II, 613	II, 614	VI, 919
41	II, 608	II, 615	II, 615	VI, 922
42	II, 617	II, 622	II, 622	VI, 925
43	II, 625	II, 626	II, 626	VI, 928
44	II, 641	II, 642	II, 642	VI, 924; 2-3/6168-1*

<u>Commission's Exhibit No.</u>	<u>Identified</u>	<u>Offered</u>	<u>Received as Evidence</u>	<u>Record Identification</u>
45	II, 705	II, 707	II, 707	VI, 930, 931
46	II, 705	II, 707	II, 707	VI, 932, 933
47	II, 884	II, 886	II, 886	VI, 934-937
48	II, 925	II, 936	II, 936	VI, 938
49	II, 925	II, 936	II, 936	VI, 941
50	III, 987	III, 993	III, 993	VI, 944
51	III, 991	III, 993	III, 993	VI, 945; 2-13/6168-1*
52	III, 991	III, 993	III, 993	VI, 946; 2-14/6168-1*
54	III, 1133	III, 1135	III, 1136	VI, 948, 949
55	III, 1133	III, 1135	III, 1136	VI, 951, 952
57	V, 3791	V, 3791	V, 3791	VI, 954, 955
58	V, 3792	V, 3792	V, 3792	VI, 956-959
61	V, 3816	V, 3816	V, 3816	VI, 962; 2-8/6168-1*
64	V, 3817	V, 3818, 3953	V, 3956	VI, 965-1008

<u>Petitioners'</u> <u>Exhibit No.</u>	<u>Identified</u>	<u>Offered</u>	<u>Received as</u> <u>Evidence</u>	<u>Record</u> <u>Identification</u>
34	III, 1192	III, 1729	III, 1730	VI, 1009-1012
48	IV, 2442	IV, 2445	IV, 2447	VI, 1013-1017
49, A & B	IV, 2691	IV, 2693	IV, 2693	VI, 1018; 2-4/6168-1 *
50, A & B	IV, 2877	IV, 2879	IV, 2879	VI, 1019; 2-5/6168-1 *
51, A - D	IV, 2937-2939	IV, 2950	IV, 2951	VI, 1020; 2-15/6168-1 *
52	IV, 2978	IV, 2984	IV, 2984	VI, 1021-1024
54, A - D	IV, 3322	IV, 3324	IV, 3324	VI, 1025; 2-16/6168-1 *
55	V, 3728	V, 3728	V, 3728	VI, 1026-1062
56	V, 3728	V, 3728	V, 3728	VI, 1066-1096
57	V, 3728	V, 3728	V, 3728	VI, 1100-1125
58	V, 3728	V, 3728	V, 3728	VI, 1131-1158
59	V, 3979	V, 3991	V, 3991	VI, 1162; 2-11/6168-1 *
60	V, 3979	V, 3991	V, 3991	VI, 1163; 2-12/6168-1 *

Appendix B

Appendix B

LIST OF WITNESSES PRODUCED BY THE PETITIONERS.

Los Angeles, California

1. Edwin L. Stanton, Owner
Stanton Oil Company,
Santa Cruz Island Company,
Long Beach and Santa Cruz Island. R. III, 1732-1777
2. Andrew J. Deleuw,
Apartment house and home owner,
Los Angeles. R. III, 1777-1804
3. Walter Knott, Owner,
Knott's Berry Farm,
Buena Park. R. III, 1804-1839
4. Ray N. Shaw, Manager,
Buffums', Santa Ana Branch Store,
Santa Ana. R. III, 1839-1891
5. Lawrence L. Sligh, Chief Engineer,
Bridgford Packing Co.,
Anaheim. R. III, 1892-1930
6. R. L. Maple,
Operating Refrigeration Engineer,
Union Ice Company, Van Nuys,
Oxnard, Claremont, Wilmington,
Anaheim, Los Angeles, San Pedro,
San Fernando. R. III, 1931-1963
7. Eugene I. Leupp,
Assistant Manager,
Associated Molding Co.,
East Los Angeles. R. III, 1963-1973
8. Joseph Suchodolski,
Maintenance Engineer,
Harris Company,
San Bernardino. R. III, 1976-2011
9. David C. Griffen,
Avocado Grower and Motion
Picture Producer,
San Marino and Fallbrook. R. III, 2011-2032

- | | | |
|-----|---|--------------------------------|
| 10. | Kenneth L. Camp, Apartment Owner,
Glendale;
former oil well completion superintendent,
Bankhead Drilling Company,
Baton Rouge, Louisiana. | R. III, 2033-2060 |
| 11. | Paul Bowen, President,
S. R. Bowen Company,
Santa Fe Springs. | R. III, 2060-2067 |
| 12. | Clay Ellis, Co-owner,
Orange Coast Nursery,
Costa Mesa. | R. III, 2069-2090 |
| 13. | Clarence L. Jarvis,
Superintendent of Buildings,
San Bernardino County Hospital,
San Bernardino. | R. III, 2090-2114 |
| 14. | Joseph A. Thunder,
Property Management, Broker,
Solana Beach. | R. III, 2114-2129
2138-2145 |
| 15. | Philip A. Rogers, Plant Foreman,
Nehi Bottling Co.,
Orange. | R. III, 2129-2137 |
| 16. | Theodore R. Berg,
Gas Laboratory Technician,
Pacific Western Oil Corp.,
Santa Fe Springs. | R. III, 2145-2155 |

Fresno, California

- | | | |
|-----|--|-------------------|
| 17. | Arthur A. Gallardo,
Superintendent,
G. W. Hume Co.,
Turlock. | R. III, 2157-2192 |
| 18. | Philip Wagner,
Maintenance Superintendent,
Anglo Bank Building,
Fresno. | R. III, 2192-2206 |
| 19. | Charles L. Boon,
Building Manager,
Anglo Bank Building,
Fresno. | R. III, 2206-2210 |

20. Richard Minor, Owner,
Minor Products Co.,
Fresno. R. III, 2211-2217
21. Joe E. Lewis, Principal,
Conejo School,
Selma. R. III, 2218-2233
22. Dr. Sydney F. Shute,
Optometrist, orchid grower,
Fresno. R. III, 2234-2242
23. George P. Butcher,
Jeweler, Orchid Nursery owner,
Fresno. R. III, 2243-2253
24. Mrs. Sherwin Shields, Housewife,
Fresno. R. III, 2253-2266
25. Fernon C. Wickstrom,
Refrigerating Engineer,
Central Valley Ice Co.,
Fresno, Exeter, Delano, Selma. R. IV, 2268-2291
26. Arthur M. Lucas,
Building Superintendent,
Fresno Bee. R. IV, 2292-2296
2307-2325
27. Mario John Barsetti,
Maintenance Man,
Fresno Bee. R. IV, 2296-2307
28. Raymond A. Crosby,
Superintending Engineer,
United States Post Office
Department, Fresno Post Office and
Court House Building. R. IV, 2325-2340

San Francisco, California

29. Al Licalsi, Machinist,
Triple A Shipyards,
San Francisco. R. IV, 2346-2360
30. George Shimmon,
Commercial Photographer,
San Francisco. R. IV, 2360-2367

31. Antone Perata,
Refrigeration Engineer,
Oakland. R. IV, 2368-2387
32. Lief Westwick,
Marine Chief Engineer,
Pope & Talbot, Inc.,
San Francisco. R. IV, 2388-2412
33. John Price, Chief Engineer,
California Sanatorium,
Belmont. R. IV, 2415-2431
34. Joseph Moran,
Marine Evis Distributor,
San Francisco. R. IV, 2431-2473
2481-2499
35. Mario Bellante,
Refrigeration Engineer,
Alioto Fish Co.,
San Francisco. R. IV, 2474-2481
36. Howard Frantz, Research Chemist,
Peninsula Laboratories,
Mountain View. R. IV, 2500-2534
2719-2747
37. Glenn Orr, Chief Engineer,
Bercut-Richards Packing Co.,
Sacramento. R. IV, 2536-2551
38. Bill A. Bouskos,
Supermarket proprietor,
Broadway Markets,
Redwood City. R. IV, 2551-2559
39. Edward C. Buchanan,
Refrigeration Engineer,
Buchanan's Refrigerator Service,
Redwood City. R. IV, 2560-2586
40. Robert T. Mathers,
1714 Hayes Street,
Owner, Cleaning Shop,
San Francisco. R. IV, 2587-2597

41. John E. Burman, Owner, R. IV, 2598-2620
Mission Laundry,
3345 - 17th Street,
San Francisco.
42. Frank V. Patmon, R. IV, 2621-2635
Cafeteria Manager,
Mare Island Naval Shipyard.
43. Lewis A. Deppman, R. IV, 2672-2677
Superintending Engineer,
Waterman Steamship Corporation,
Pacific Coast,
San Francisco.
44. Carl R. Shepard, Chief, R. IV, 2677-2687
Construction and Supervision
Branch, General Services
Administration, U.S.A.,
San Francisco.
45. Jack F. Manney, Jr., R. IV, 2688-2703
Shop Planner,
Naval Ammunition Depot,
Mare Island, California.
46. Christopher S. Wood, R. IV, 2704-2718
Supervisor, Ammunition
Case reconditioning,
Naval Ammunition Depot,
Mare Island, California.
47. John Blake, Jr., Manager, R. IV, 2748-2763
FWD Pacific Co., former
Chief Engineer,
American President Lines,
S.S. "President Madison" and
S.S. "President Pierce,"
San Francisco.
48. Frank Danerro, R. IV, 2764-2772
Plant Maintenance,
Happy Home Dairy,
Lodi, California.

49. Milton Scott, Administrator-Manager, Fairfield Hospital, Fairfield. R. IV, 2772-2785
50. Edith Helen Collins, Stewardess, Yosemite Club, 311E Main Street, Stockton. R. IV, 2825-2838
51. Ben Bava, Engineer, College of the Pacific, Stockton. R. IV, 2838-2849
52. Gloria Frances Sirene, Chemist, Peninsula Laboratories, Mountain View. R. IV, 2849-2873
53. Paul H. Ralston, home owner, San Mateo; Branch Manager, Cook's Oil Company. R. IV, 2875-2891
54. Philip Anderson, Jr., Chief Engineer, S.S. "Young America," Waterman Steamship Corporation, Mobile, Alabama. R. IV, 2892-2906
55. Arthur F. Tudury, Evis Distributor, Refrigerating & Power Specialties Co., San Francisco. R. IV, 2906-2953
2977-2984
56. William J. O'Connell, Consulting Engineer, Burlingame. R. IV, 2955-2977
2985-3050

Tacoma, Washington

57. Frank X. Fischlin, Owner, Supreme Dairy, Tacoma. R. IV, 3063-3071
58. Frank M. Fischlin, Supreme Dairy, Tacoma. R. IV, 3071-3077
59. Ellis J. Shane, Engineer, American Rock Wool Corp., Tacoma. R. IV, 3077-3089

60. Howard H. LaVictoire, R. IV, 3089-3100
Quality Supervisor,
American Rock Wool Corp.,
Tacoma.
61. Sivert Wiborg, R. IV, 3101-3118
Maintenance Superintendent,
Dickman Lumber Co.,
Tacoma.
62. Axel Berg, Fireman, R. IV, 3119-3132
Western Lumber Mfg. Co.,
Tacoma.
63. Matthew W. Ryan, R. IV, 3133-3142
Chief Engineer,
Leybold-Smith Shingle Co.,
Tacoma.
64. Quentin A. Herwig, R. IV, 3143-3155
Evis Franchise Distributor,
Seattle.
65. Carl H. Grimm, R. IV, 3156-3163
Evis Service and Sales,
Seattle. 3363-3366
66. Milford J. Anderson, Partner, R. IV, 3178-3190
Anderson Fir Finish Company,
Tacoma.
67. Carl G. Rosengren, R. IV, 3190-3202
Maintenance Man,
Washington Cleaners,
Lauderers & Dyers,
Tacoma.
68. Earl C. Maitland, Co-owner, R. IV, 3202-3220
Wested Tire Company,
Tacoma.
69. Harry Guske, Maintenance Man, R. IV, 3220-3226
North Pacific Plywood Co.,
Tacoma.

70. Walter Hasbrook, Jr., Chemist,
Peninsula Laboratories,
Mountain View, California. R. IV, 3227-3234
3252-3313
71. R. E. Burke, Fireman,
Tacoma Harbor Timber &
Lumber Co., Tacoma. R. IV, 3237-3252
72. Thomas W. Simington,
Farm Co-operative Manager,
Vancouver, B. C.
73. Clifton B. Morris,
Owner, Cleaning Shop,
Puyallup. R. IV, 3329-3338
74. Erle C. Young, Engineer,
St. Joseph's Hospital,
Tacoma. R. IV, 3339-3349

Seattle, Washington

75. Shig Takeuchi,
Equipment Maintenance,
Main Fish Co., Seattle. R. IV, 3352-3362
76. Raymond Louis Peel,
Plant Manager,
Rainier State School,
State of Washington, Buckley. R. IV, 3366-3390
77. Francis H. Howard, Port Engineer,
American Mail Line, Seattle. R. IV, 3392-3397
78. W. W. Smithers, Chief Engineer,
S.S. "Explorer,"
Pope & Talbot, Inc.,
San Francisco, California. R. IV, 3397-3405

Dallas, Texas

79. Roy Guffy, Partner,
Roy Guffy Drilling Co.,
Dallas. R. V, 3409-3436
80. J. M. Gardner, Vice President,
Delta Gulf Drilling Co.,
Dallas. R. V, 3436-3450

81. Ernest W. Tatum, Foreman, R. V, 3450-3459
 Jack Shook Tire Co.,
 Dallas.
82. J. C. Pharr, Chief Engineer, R. V, 3460-3493
 Buckner Orphans Home,
 Dallas.
83. J. W. Little, Manager, R. V, 3493-3502
 Mayfair Hotel,
 Dallas.
84. Carl E. Doss, R. V, 3502-3516
 Co-owner and Manager,
 Shamrock Motel,
 Dallas.
85. Charles R. Monk, R. V, 3518-3529
 Rig Supervisor, 3543-3558
 Odessa, Texas.
 Helmerich & Payne, Inc.,
 Tulsa, Oklahoma.
86. John H. Pendergrass, Manager, R. V, 3530-3543
 Dolch Concrete Pipe Co.,
 Dallas.
87. Leonard C. Smith, R. V, 3559-3563
 Maintenance Foreman, 3583-3611
 Odessa, Texas,
 Guy Mabee Drilling Company,
 Midland, Texas.
88. Orville H. McCartney, R. V, 3564-3581
 District Superintendent,
 Kilgore, Texas,
 Three States Natural Gas Co.,
 Dallas, Texas.
89. Herman M. Waldman, Partner, R. V, 3612-3625
 Dallas City Packing Co.,
 Dallas.
90. Burton N. Fullen, Owner, R. V, 3625-3643
 Oaklawn Cleaners,
 Dallas.

91. M. L. Middleton, Manager, R. V, 3643-3673
T. S. Schroeder Estate,
Oil Operators, Dallas.
92. W. E. Weaver, Vice President, R. V, 3675-3685
Nemaha Oil Co., homeowner,
Dallas.
93. Thomas A. Young, R. V, 3686-3704
Refrigeration Maintenance,
Worth Food Markets,
Fort Worth.
94. Roy T. Durst, R. V, 3705-3723
Petroleum Consulting Engineer,
Gruy and Durst,
Fort Worth, Texas;
formerly Production Superintendent,
Rowan Oil Company.

Depositions

95. Samuel R. Morris, R. IV, 2637-2663
Inglewood, California,
Custodian-Chief Engineer,
S.S. "Ampac Washington" and
S.S. "Memory,"
Transoceanic Marine Corporation.
96. Alexander MacKenzie, R. IV, 3168-3178
Leonia, N. J.,
Chief Engineer, S.S. "Esparta,"
United Fruit Company.
97. George J. Bowersock, Respondents' Exhibit No. 58
Stockton, California, R. VI, 1131-1161
Chief Engineer, S.S. "Voyager,"
Pope & Talbot, Inc.,
San Francisco.
98. John B. MacKenzie, Respondents' Exhibit No. 55
New Orleans, Louisiana, R. VI, 1026-1065
Chief Engineer, S.S. "Kyska,"
Waterman Corporation of
California.

99. Denzel R. Carpenter, Respondents' Exhibit No. 56
Gardena, California, R. VI, 1066-1099
Chief Engineer, S.S. "Santa
Paula,"
Union Oil Company,
Los Angeles.
100. Frank C. Terres, Respondents' Exhibit No. 57
Walwick, New Jersey, R. VI, 1100-1130
Chief Engineer, S.S. "Comayaga,"
United Fruit Company.

Appendix C

SCALE—PREVENTION AND REMOVAL*

No. in Index	Number of Evis units		Boilers	Air conditioning and refrigeration equipment		Engine radiators; coolant lines		Heaters, urns and marine evaporators; washers		Piping systems, valves, nozzles; misc.	
	Total identified by witness	Identified re scale removal		Evis units	No. of boilers	Evis units	No. of equipment	Evis units	No. of equipment	Evis units	No. of Evis units
1	Edwin L. Stanton	16 (1759 1763)	9	1	1	1	1	3	3	5	(1739-1745)
2	Andrew J. Deleuw	3 (1783- 1791)	3	3						3	(1785- 1791)
3	Walter Knott	2 (1810)	1	1	1	2	1	1	1	1	(1820- 1829)
4	Ray N. Shaw	1 (1846)	1	1	1	3	1	1	1	1	(1860- 1869)
5	Lawrence L. Sligh	1 (1895)	1	1	2		1	1	1	1	(1858 1879)
6	R. L. Maple	8 (1933 1945 1947 1948)	8	8	8	8	8	8	8	8	
7	Eugene I. Leupp	1 (1964)	1	1	1	1	1	1	1	1	(1970)
8	Joseph Suchodolski	1 (1982)	1	1	1	3	1	1	1	1	(1982 1984 1986 1990 1991)

*Transcript references in this Appendix are to testimony in volumes III, IV and V of the Transcript of the Record. Volume III includes pages 978 through 2,266; Volume IV includes pages 2,267 through 3,407; Volume V includes pages 3,408 through 3,994. Four depositions included in the Appendix are set forth in Volume VI, having been admitted as petitioners' exhibits. They are: John B. MacKenzie, Waterman Corporation of America, RX 55, R. VI, 1026-1065; Donald R. Charnoster, Edison Oil Company, RX 56, P. VII, 1066-1069.

No. in Index	Name	Number of Evis units		Boilers		Air conditioning and refrigeration equipment		Engine radiators; coolant lines		Heaters, urns and marine evaporators; washers		Systems, valves, nozzles; misc.	
		Total identified by witness	Identified re scale prevention	Evis units	No. of boilers	Evis units	No. of equipment	Evis units	No. of lines	Evis units	No. of washers	Evis units	No. of units
9	David C. Griffen	1 (2018)	1									1 (2026)	
10	Kenneth L. Camp	4 (2035 2045)	3					3 (2036, 2038, 2043, 2045)					
11	Paul Bowen	1 (2062)	1									1 (2065-2067)	
12	Clay Ellis	1 (2074)	1									1 (2076)	
13	Clarence L. Jarvis	1 (2092)	1			1 (2099, 2106)	1			1 (2098 2100 2106)		1 (2097)	
14	Joseph A. Thunder	4 (2121 2123 2139)	3									3 (2121-2122)	
15	Philip A. Rogers	1 (2130)	1							1 (2133)		1 (2132-2137)	
16	Theodore R. Berg	1 (2151)	1							1 (2151)			
Fresno, California													
17	Arthur A. Gallardo	4 (2162)	4		4 (2166-2169)								
18	Philip Wagner	1 (2193)	1			1 (2196)	1					1 (2196 2206)	
19	Charles L. Boon											1 (2209)

No. in Index	Number of Evis units		Boilers	Air conditioning and refrigeration equipment	Engine radiators; coolant lines	Heaters, urns and marine evaporators; washers	Piping systems, valves, nozzles; misc.
	Total identified by witness	Identified re scale prevention					
	identified re scale	identified re scale					
20	Richard Minor	1	1	1	1	1	1
		(2212)	(2213)	(2214)			
21	Joe F. Lewis	1	1			1	1
		(2220)				(2225)	(2222 2225)
22	Dr. Sydney F. Shute	1	1	1		1	1
		(2236)					(2236 2242)
23	George P. Butcher	1	1	1		1	1
		(2246)					(2246 2248)
24	Mrs. Sherwin Shields	1	1	1	1	1	1
		(2254)		(2257)			(2257)
25	Fernon C. Wickstrom	6	2	6	6		
		(2270 2277 2279)		(2276, 2278, 2279, 2281, 2282, 2283)			
26	Arthur M. Lucas	1	1	1	2	1	1
		(2294)		(2311 2315)			(2312)
27	Mario John Barsetti		(1)	(1)			
		4	4	4	4		
28	Raymond A. Crosby	4	4	4	6		
		(2326 2328)		(2300, 2304)			(2332, 2333, 2336)
San Francisco, California							
29	Al Licalsi	1	1	1	1		
		(2348)		(2349-2350)			
31	Antone Perata	1	1	1	2	1	1
		(2374)		(2378, 2379)			

No. in Index	Name	Number of Evis units		Boilers		Air conditioning and refrigeration equipment		Engine radiators; coolant lines		Heaters, urns and marine evaporators; washers		Piping systems, valves, nozzles; misc.	
		Total identified by witness	Identified re scale removal	Evis units	No. of boilers	Evis units	No. of equipment	Evis units	No. of equipment	Evis units	No. of Evis units	No. of Evis units	No. of Evis units
45	Jack F. Manney, Jr.	1	1	1	1							1	(2691-2693)
47	John Blake, Jr.	2	2							2			(2753-2757)
48	Frank Danerro	1	1	1	1					1			(2768-2769)
49	Milton Scott	1	1	1	1					1			(2777-2781)
50	Edith H. Collins	1	1	1	1								(2829)
51	Ben Bava	2	1	1	2	1	1			1			(2843-2845)
53	Paul H. Ralston	1	1	1	1								(2880-2881)
54	Philip Anderson, Jr.	1	1	1	1					1			(2899-2900)
Tacoma, Washington													
57	Frank X. Fischlin	1	1	1	1								(3069)
58	Frank M. Fischlin	(1)	(1)	(1)					1			(3074)
59	Ellis J. Shane	1	1	1	1								(3082-3084)

No. in Index	Name	Number of Evis units		Boilers		Air conditioning and refrigeration equipment		Engine radiators: coolant lines		Heaters, urns and marine evaporators; washers		Systems, valves, nozzles; misc.					
		Total identified by witness removal	Identified re scale prevention	Evis units	No. of boilers	Evis units	No. of equipment	Evis units	No. of equipment	Evis units	No. of washers	Evis units	No. of	Evis units			
		(1)	(1)	(3097)	(3103)	(3121)	(3134)	(3180)	(3192)	(3204)	(3221)	(3239)	(3330)	(3341)	(3355)	(3368)	(3387)
60	Howard LaVictoire	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1
61	Sivert Wiborg	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1
62	Axel Berg	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1
63	Matthew W. Ryan	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
66	Milford J. Anderson	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
67	Carl G. Rosengren	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
68	Earl C. Maitland	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
69	Harry Guske	1	1	1	3	1	1	1	1	1	1	1	1	1	1	1	1
71	R. E. Burke	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1
73	Clifton B. Morris	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
74	Erle C. Young	2	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1
Seattle, Washington																	
75	Shig Takeuchi	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
76	Raymond Peel	1	1	1	3	1	1	1	1	1	1	1	1	1	1	1	1

No. in Index	Name	Number of Evis units		Boilers		Air conditioning and refrigeration equipment		Engine radiators; coolant lines		Heaters, urns and marine evaporators; washers		Piping systems, valves, nozzles; misc.	
		Total identified by witness	Identified re scale prevention	Evis units	No. of boilers	Evis units	No. of equipment	Evis units	No. of equipment	No. of Evis units	No. of Evis units	No. of Evis units	No. of Evis units
77	Francis H. Howard	9 (3392)	9							9 (3393-3395)			
78	W. W. Smithers	2 (3399-3401)	2							2 (3401-3402)			
Dallas, Texas													
79	Roy Guiffy	23 (3412-3413)	23	23								23 (3417-3429)	
80	J. M. Gardner	5 (3439-3441)	5	5	19 (3441-3444)								
81	Ernest W. Tatum	1 (3454)	1	1	1 (3455-3456)								
82	J. C. Pharr	8 (3480-3481)	6	6	3 (3468-3473-3474)	10	2 (3469)	6			3 (3477-3480)	3 (3477-3492)	
83	J. W. Little	1 (3494)	1	1			1 (3498-3500)	1					
84	Carl E. Doss	1 (3507)	1	1			1 (3510)	1					1 (3508-3510)
85	Charles R. Monk	8 (3545-3549-3550)	8	8					8 (3548-3558)	18			
86	John H. Pendergrass	3 (3532)	3	3							3 (3535-3542)		

No. in Index	Number of Evis units		Boilers		Air conditioning and refrigeration equipment		Engine radiators; coolant lines		Heaters, urns and marine evaporators; washers		systems, valves, nozzles; misc.	
	Total identified by witness	Identified re scale prevention	Evis units	No. of boilers	Evis units	No. of equipment	Evis units	No. of equipment	Evis units	No. of washers	Evis units	No. of Evis units
87 Leonard C. Smith	18 (3594-3596)	18	18	18	18	18	18	18	1	2	(3572-3574)	(3567-3568)
88 Orville H. McCartney	3 (3567-3570)	3	3	3	3	3	3	3	1	2	(3572-3574)	(3567-3568)
90 Burton N. Fullen	1 (3626)	1	1	1	1	1	1	1	1	1	(3636)	(3636)
91 M. L. Middleton	4 (3645-3657)	4	4	4	4	4	4	4	3	3	(3652-3662-3664)	(3654-3655, 3668)
92 W. E. Weaver	2 (3679)	2	2	2	2	2	2	2	2	2	(3682)	(3682-3683)
93 Thomas A. Young	17 (3687)	17	17	17	17	17	17	17	17	17	(3694-3698, 3703)	(3694-3698, 3703)
94 Roy T. Durst	1 (3714)	1	1	1	1	1	1	1	1	1	(3710-3716, 3723)	(3714)
95 Samuel R. Morris	1 (2639-2658)	1	1	1	1	1	1	1	1	1	(2646-2649)	(2646-2649)
96 Alexander MacKenzie	1 (3169)	1	1	1	1	1	1	1	1	1	(3171-3173)	(3171-3173)

Depositions

RECAPITULATION OF APPENDIX C

SCALE—PREVENTION AND REMOVAL

No. of witnesses	Place of hearing	Number of Evis units		Boilers		Air conditioning and refrigeration equipment		Engine radiators; coolant lines		Heaters, urns and marine evaporators; washers		Piping systems, valves, nozzles; misc.	
		Total identified by witnesses	Identified re scale prevention	Evis units	No. of boilers	Evis units	No. of equipment	Evis units	No. of equipment	Evis units	No. of equipment	Evis units	No. of Evis units
16	Los Angeles, California, May 23-26, 1955	47	29	37	5	6	13	18	6	6	9	19	
12	Fresno, California, May 31-June 1, 1955	21	16	21	5	5	13	17		1	6		
21	San Francisco, California, June 2-9, 1955	50	11	41	8	9	7	37		24	7		
14	Tacoma, Washington June 13-15, 1955	13	10	12	12	18				1	2		
4	Seattle, Washington June 16, 1955	13	9	13	1	3	1	1		12			
15	Dallas, Texas October 12-14, 1955	96	87	94	12	33	23	26	49	59	14	12	
6	Depositions (Marine Engineers)	7	6	7							7		
		247	168	225	43	74	57	99	55	65	68	46	
(88 witnesses)		(63 witnesses)	(88 witnesses)	(34 witnesses)	(26 witnesses)	(5 witnesses)	(33 witnesses)	(31 witnesses)					

Appendix D

Appendix D

IMPROVEMENT OF AGRICULTURAL GROWTH, LEACHING OF ALKALI, PREVENTION AND REMOVAL OF DEPOSITS ON LEAVES OF PLANTS, AND INHIBITION OF ALGAE GROWTH.

No. in Index	Witness	No. of Evis units	Record
1	Edwin L. Stanton	7	III, 1739-1740, 1759-1763
3	Walter Knott	2	III, 1810, 1823-1824
9	David C. Griffen	1	III, 2018, 2018-2023
12	Clay Ellis	1	III, 2074
14	Joseph A. Thunder	3	III, 2121-2127, 2139
21	Joe E. Lewis	1	III, 2220-2223
22	Dr. Sydney F. Shute	1	III, 2236-2242
23	George P. Butcher	1	III, 2246-2248
24	Mrs. Sherwin Shields	1	III, 2254-2256
31	Antone Perata	1	IV, 2374-2378
35	Mario Bellante	1	IV, 2476-2477
36	Howard Frantz	1	IV, 2518-2522
52	Gloria F. Sirene	-	IV, 2855-2857
72	Thomas W. Simington	1	IV, 3314-3321
		—	
Total No. of Evis units:		22	

Total No.
of witnesses: 14

Appendix E

Appendix E

IMPROVEMENT IN ODOR OR TASTE OF WATER OR MAKING OF BETTER TASTING COFFEE.

No. in Index	Witness	No. of Evis units	Record
2	Andrew J. Deleuw	1	III, 1791
10	Kenneth L. Camp	1	III, 2047
24	Mrs. Sherwin Shields	1	III, 2258
42	Frank V. Patmon	1	IV, 2627
50	Edith H. Collins	1	IV, 2830
53	Paul H. Ralston	1	IV, 2881-2888
91	M. L. Middleton	2	V, 365

Total No. of Evis Units: 8

Total No.
of witnesses: 7

Appendix F

Appendix F

EFFECTIVE USE IN REMOVAL OF GREASE FROM DRAINS, PREVENTING VARIOUS TYPES OF STAINS AND SCUMS AND IN RETARDING THE PITTING OF METAL.

<u>No. in Index</u>	<u>Witness</u>	<u>No. of Evis units</u>	<u>Record</u>
2	Andrew J. Deleuw	1	III, 1783, 1789
4	Ray N. Shaw	1	III, 1846, 1872
6	R. L. Maple	1	III, 1941
8	Joseph Suchodolski	1	III, 1982, 1994
10	Kenneth L. Camp	1	III, 2049-2050
41	John E. Burman	1	IV, 2602, 2612
44	Carl R. Shepard	1	IV, 2682-2685
46	Christopher S. Wood	4	IV, 2707-2712
50	Edith H. Collins	1	IV, 2826-2829
70	Walter Hasbrook, Jr.	1	IV, 3286, 3277
76	Raymond L. Peel	1	IV, 3386-3387
82	J. C. Pharr	2	V, 3471, 3481
84	Carl E. Doss	1	V, 3507, 3508
88	Orville H. McCartney	2	V, 3567-3568
89	Herman M. Waldman	1	V. 3614, 3619-3620
91	M. L. Middleton	2	V, 3654-3655
92	W. E. Weaver	2	V, 3679-3682
Total No. of Evis units:		24	

Total No.
of witnesses: 17

Appendix G

Appendix G

LAUNDRY USES AND EFFICIENCY OF SOAP.

No. Appendix B	Witness	No. of Evis units	Record
2	Andrew J. Deleuw	2	III, 1783-1791
3	Walter Knott	1	III, 1810, 1822
4	Ray N. Shaw	1	III, 1846, 1875
9	David C. Griffen	1	III, 2018, 2024-2026
12	Clay Ellis	1	III, 2074, 2075
14	Joseph A. Thunder	1	III, 2121-2123, 2139
15	Philip A. Rogers	1	III, 2130, 2134
24	Mrs. Sherwin Shields	1	III, 2254, 2256
36	Howard Frantz	1	III, 2056; IV, 2510-2514
37	Glenn Orr	1	IV, 2544-2546
41	John E. Burman	1	IV, 2602, 2605-2615
46	Christopher S. Wood	4	IV, 2707-2710, 2712-2713
50	Edith H. Collins	1	IV, 2826, 2831-2832
53	Paul H. Ralston	1	IV, 2876, 2882
70	Walter Hasbrook	-	IV, 3256
74	Erle C. Young	1	IV, 3341, 3346
76	Raymond L. Peel	1	IV, 3377-3380, 3382
90	Burton N. Fullen	1	V, 3626, 3634

Total No. of Evis units: 21

Total No.
of witnesses: 18

